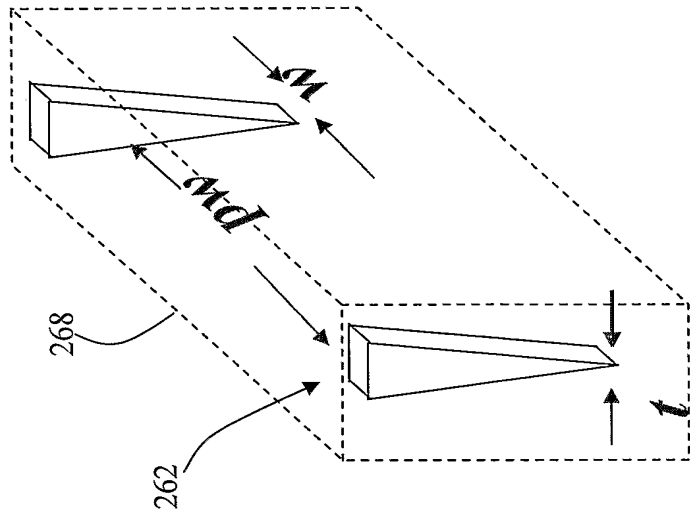
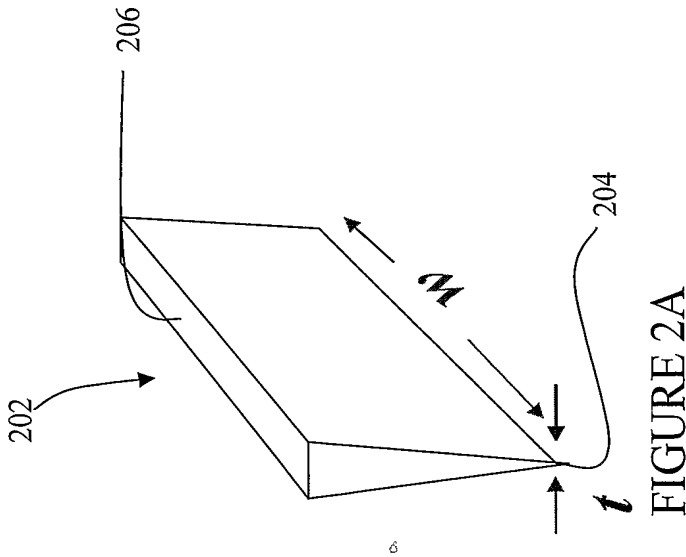
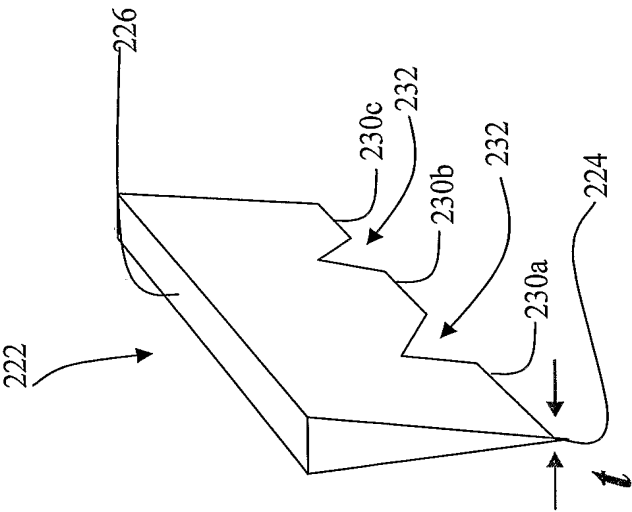
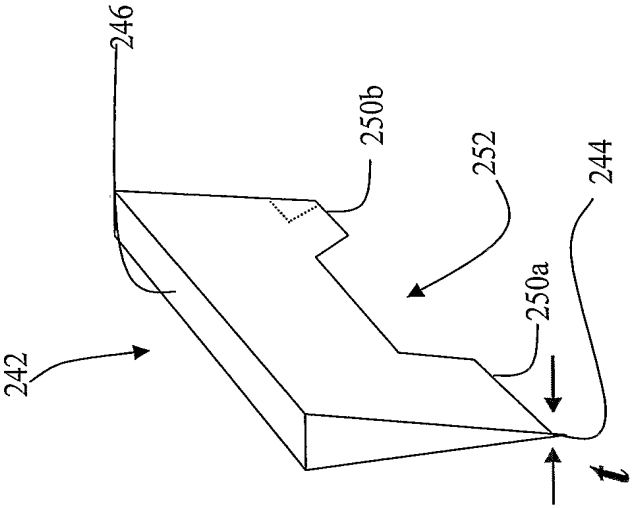


FIGURE 1





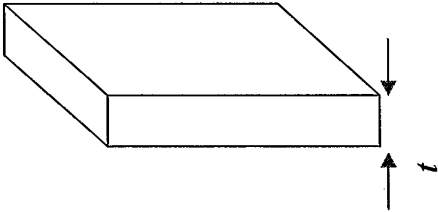


FIGURE 3D

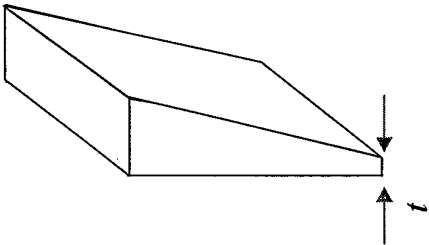


FIGURE 3B

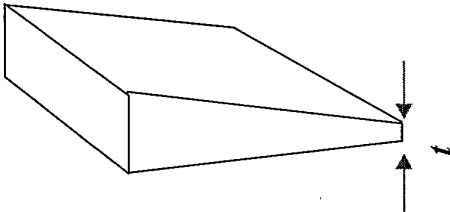


FIGURE 3C

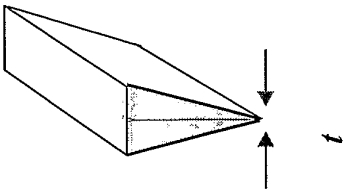


FIGURE 3E

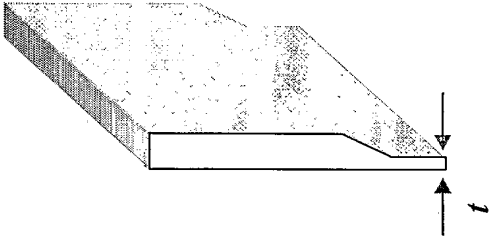


FIGURE 3A

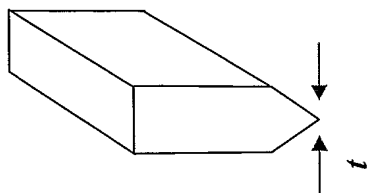


FIGURE 3F

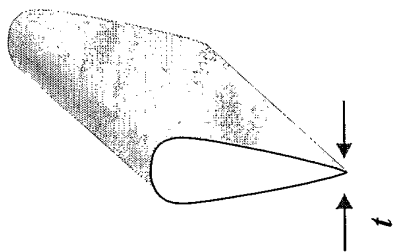


FIGURE 3H

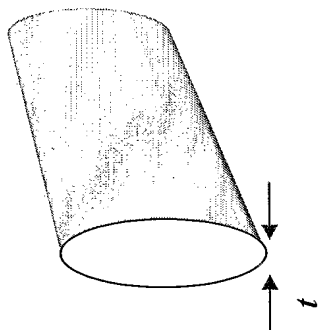


FIGURE 3J

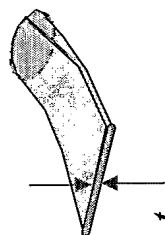


FIGURE 3K

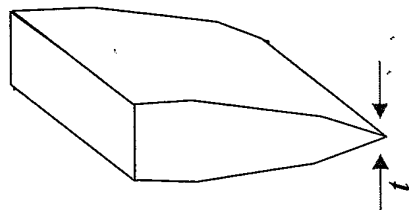


FIGURE 3G

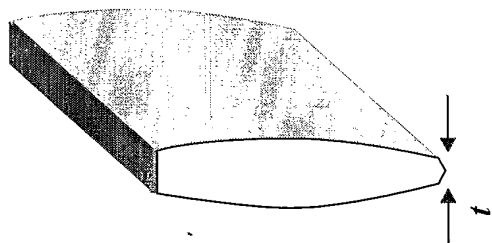


FIGURE 3I

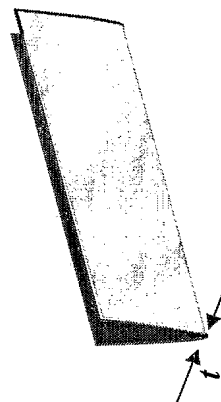


FIGURE 3L

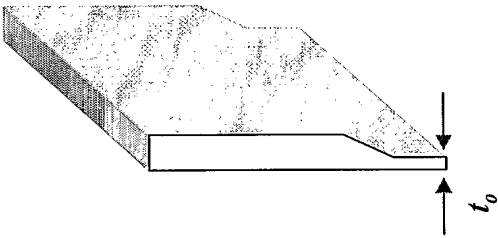


FIGURE 4A

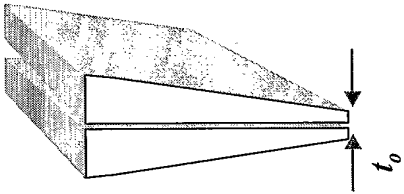


FIGURE 4C

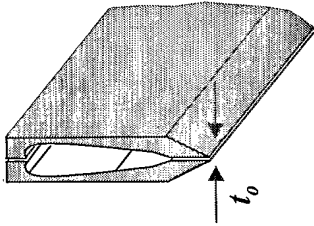


FIGURE 4E

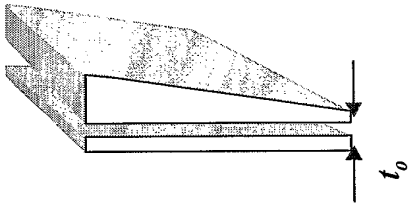


FIGURE 4B

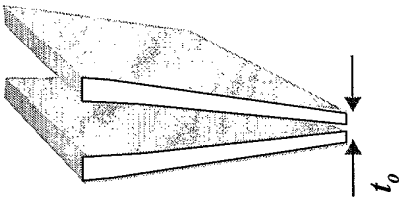


FIGURE 4D

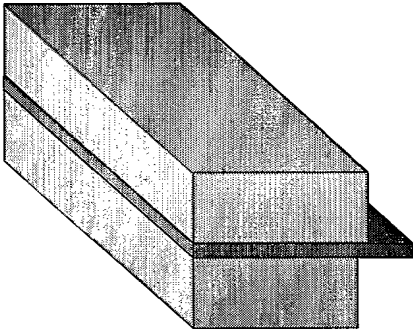
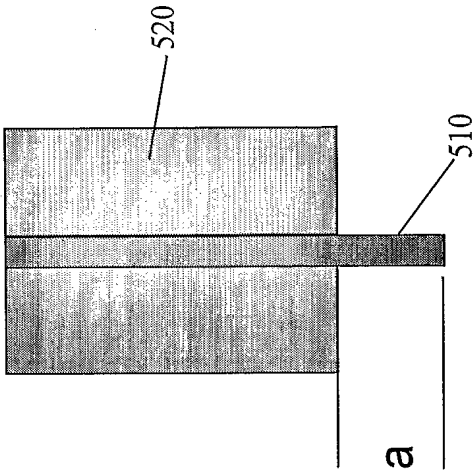
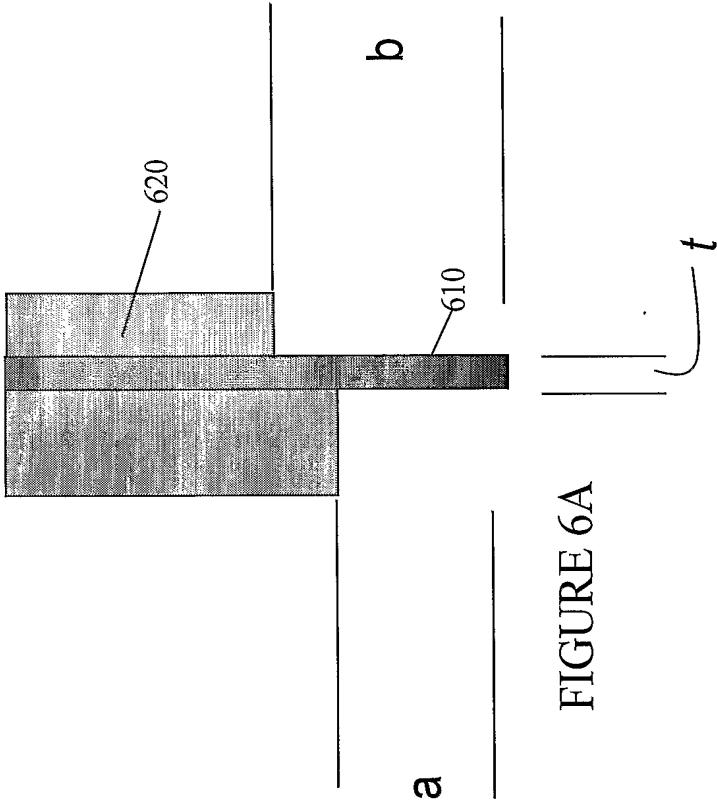


FIGURE 6B

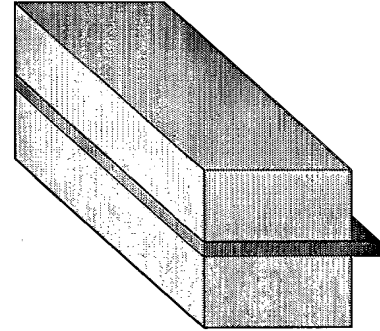


FIGURE 5B



FIGURE 7

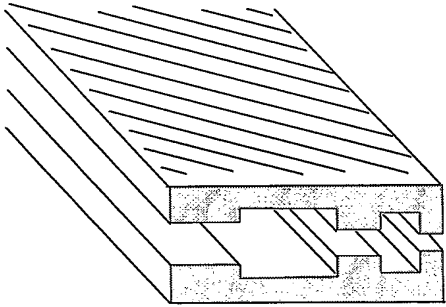


FIGURE 8A

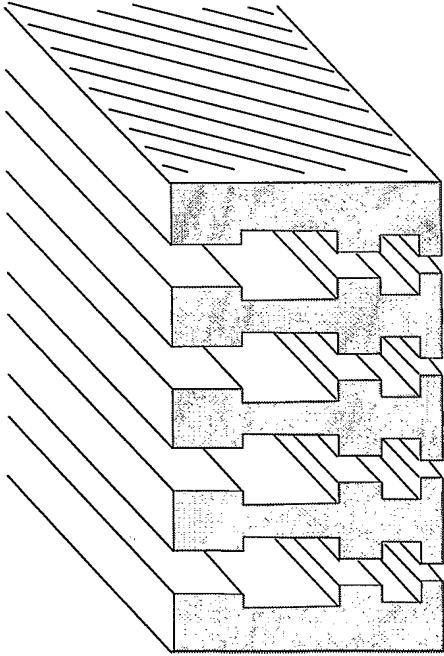


FIGURE 8B

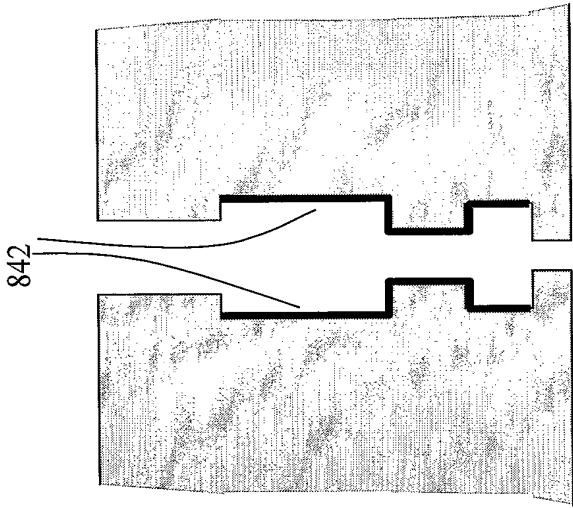


FIGURE 8C

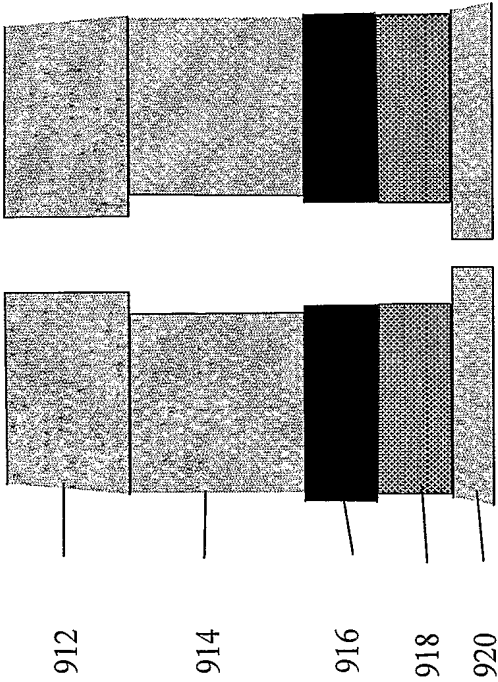


FIGURE 9A

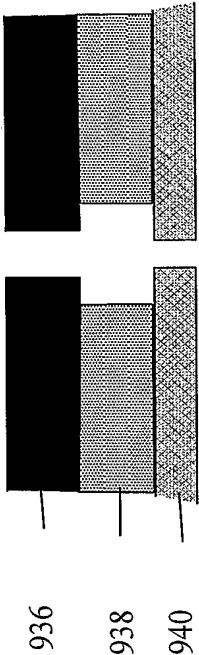
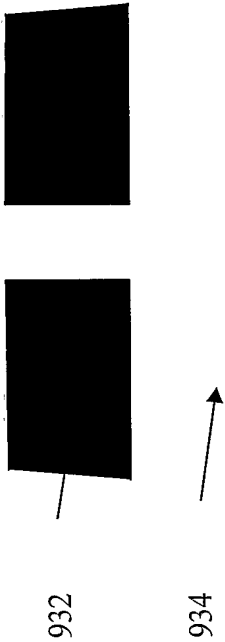
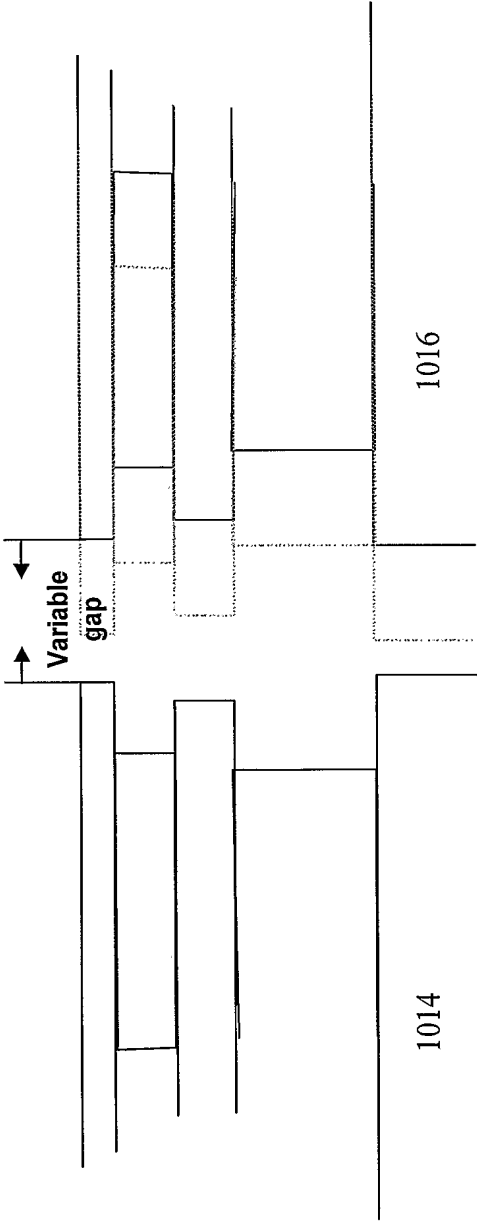


FIGURE 9B

1010

1012



1014

1016

FIGURE 10A

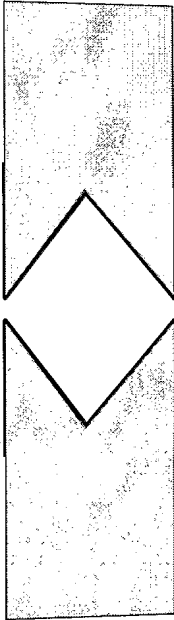


FIGURE 10B1

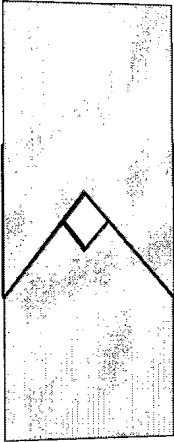


FIGURE 10B2

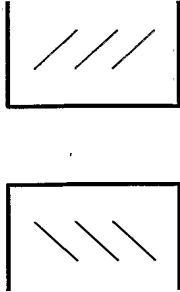


FIGURE 10C1

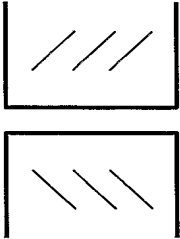
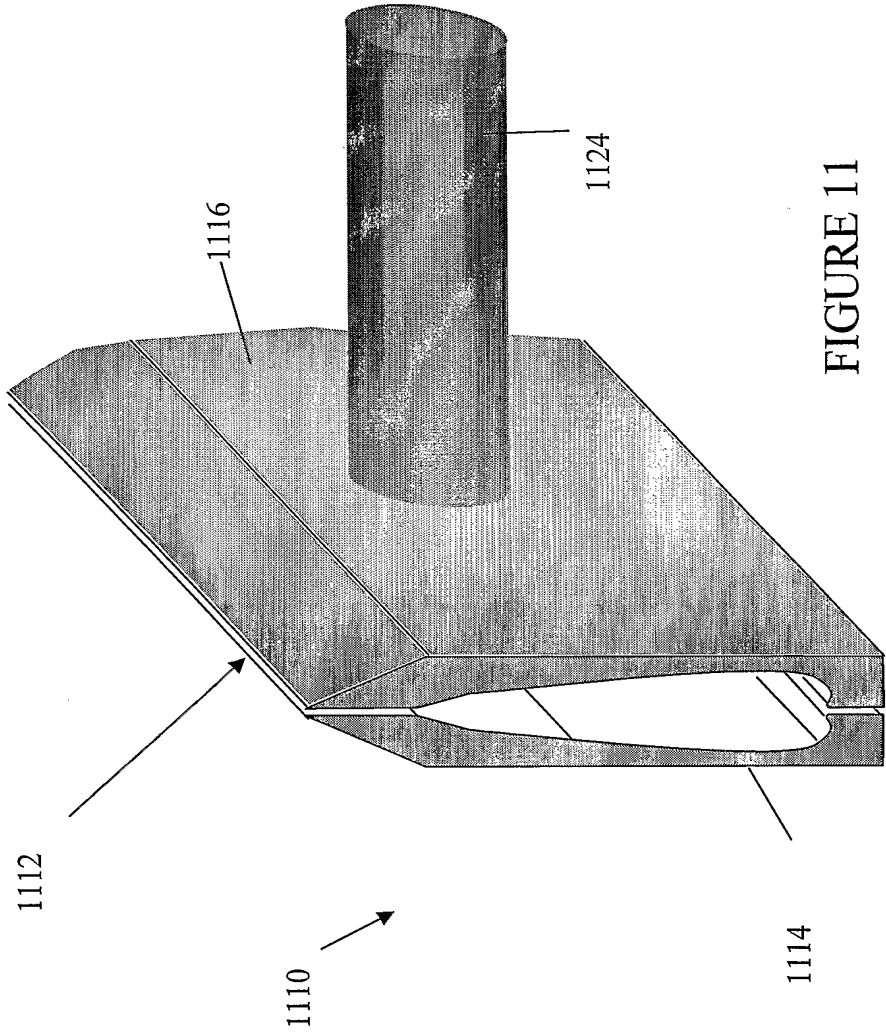


FIGURE 10C2



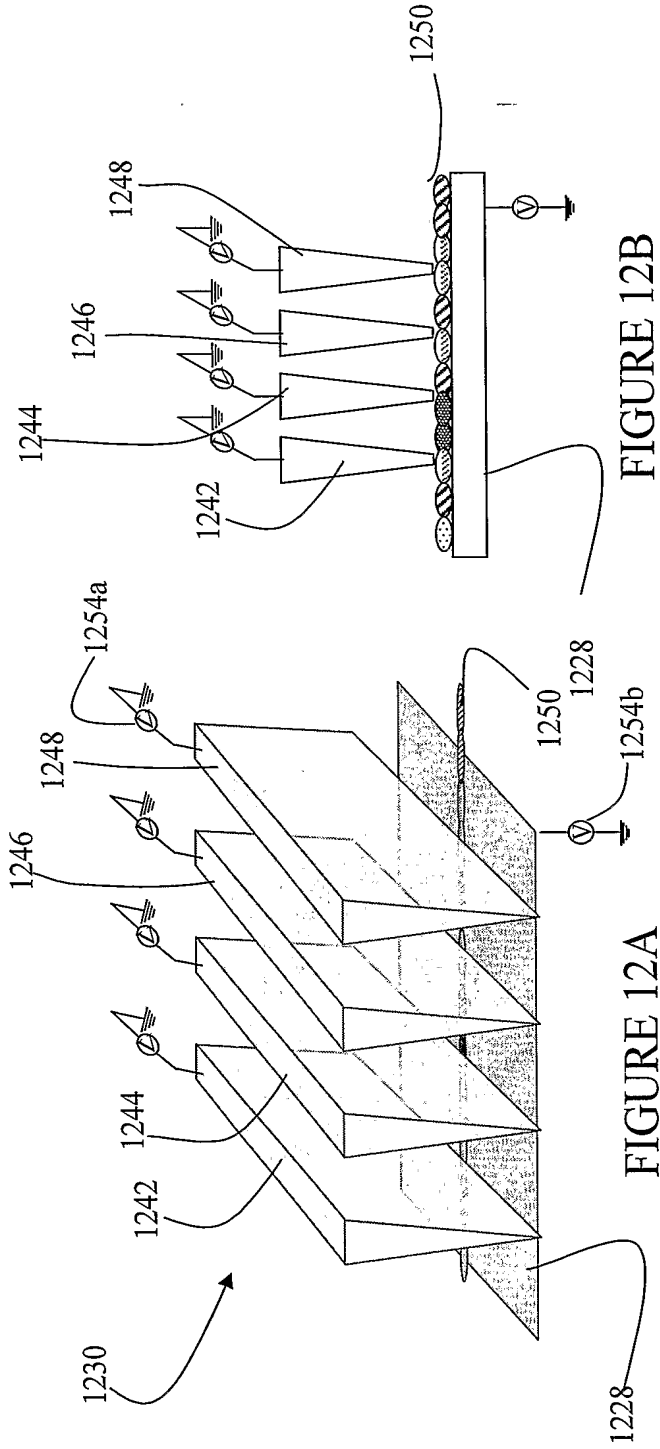


FIGURE 12B

FIGURE 12A

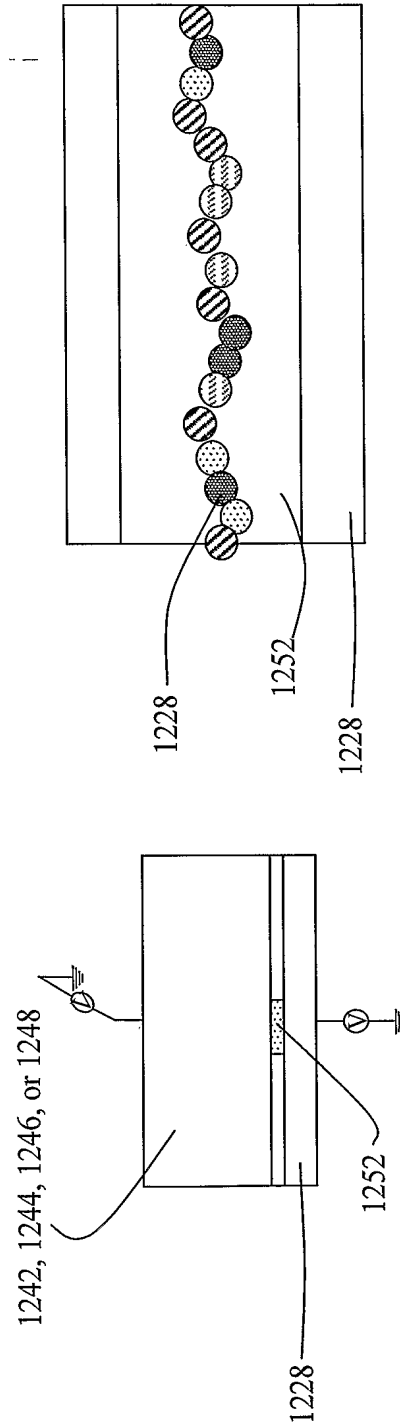
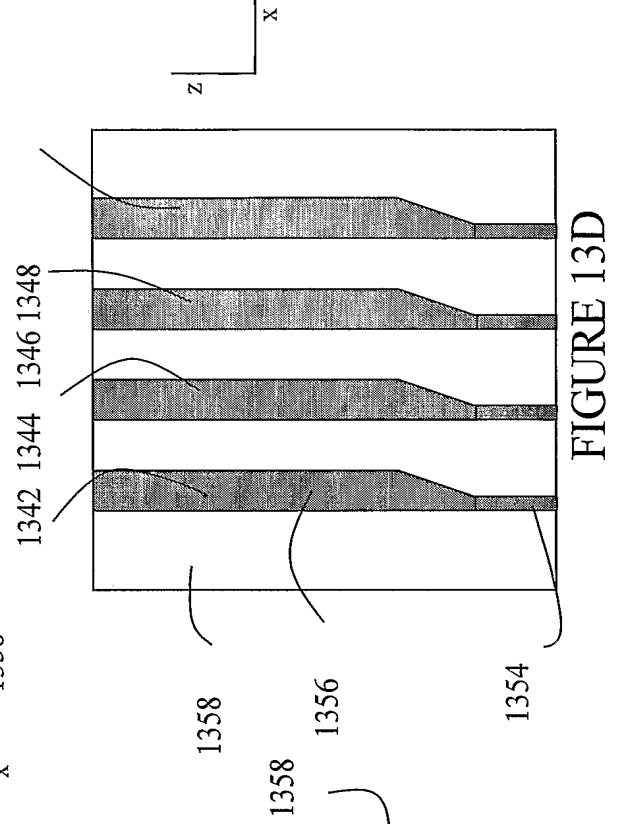
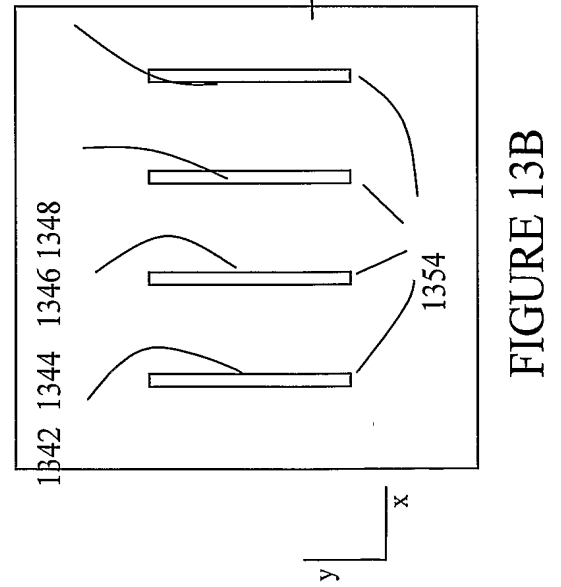
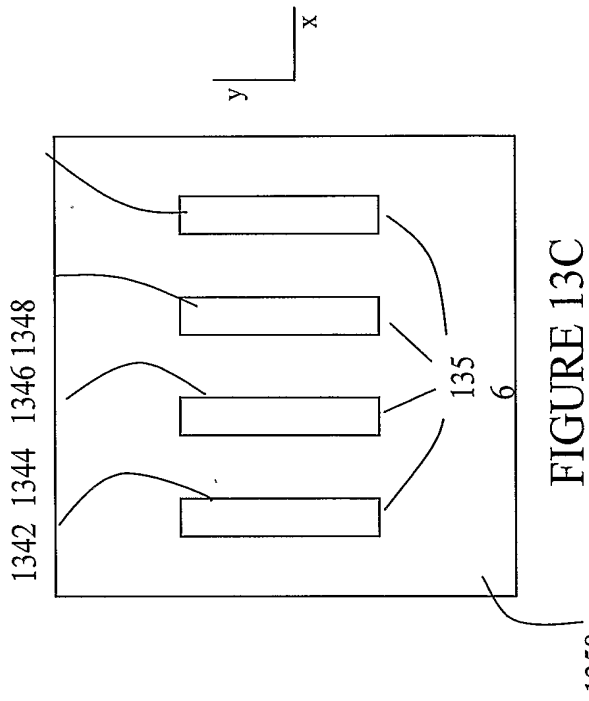
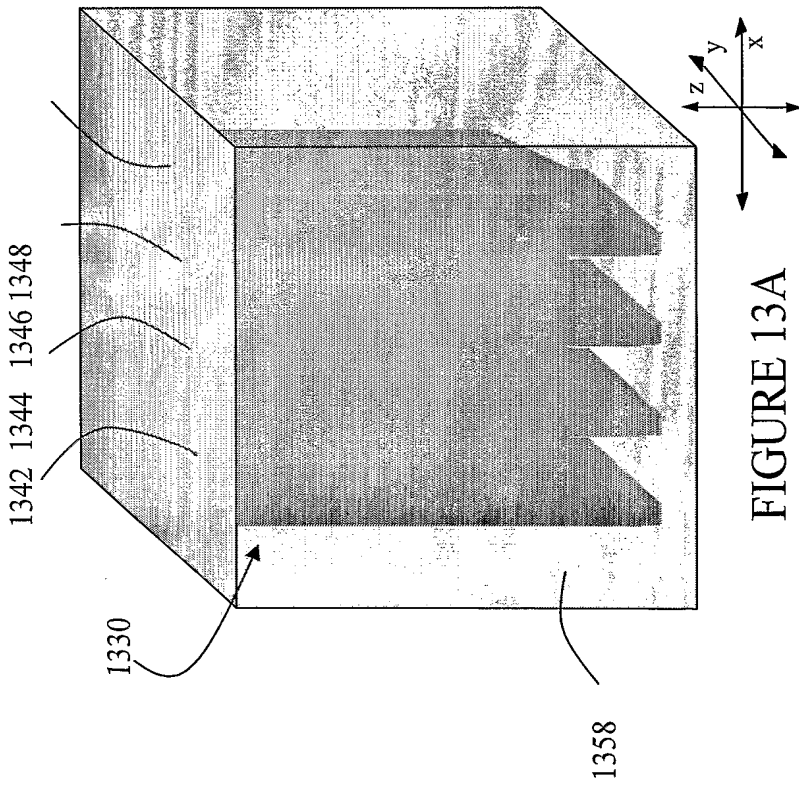


FIGURE 12C

FIGURE 12D



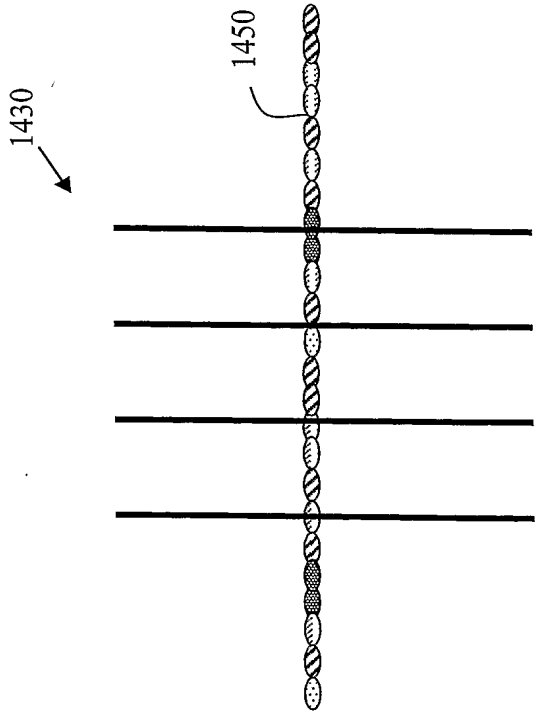


FIGURE 14A

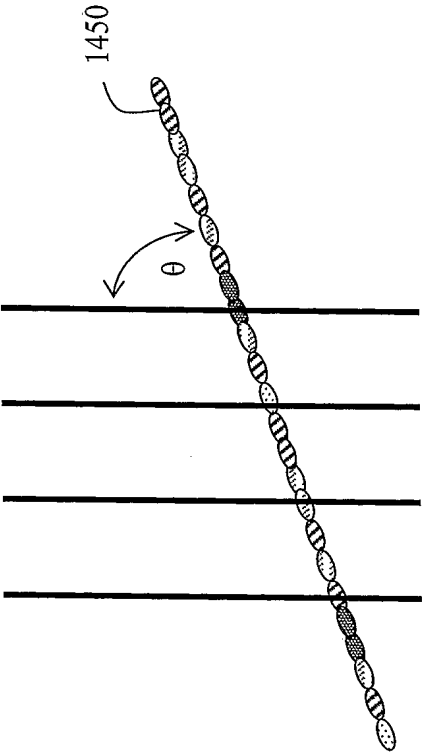


FIGURE 14B

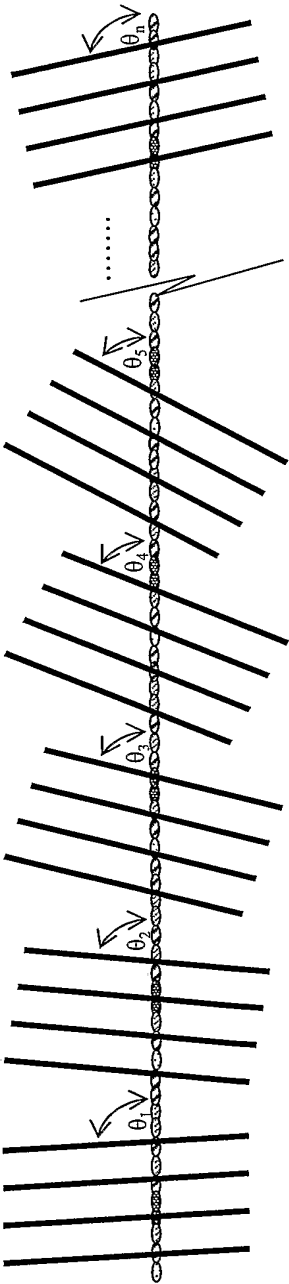


FIGURE 14C

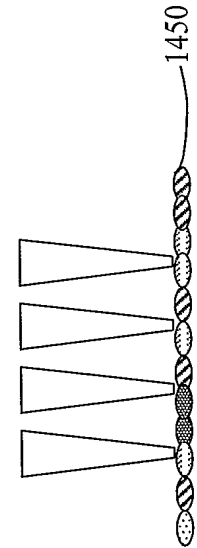


FIGURE 14D

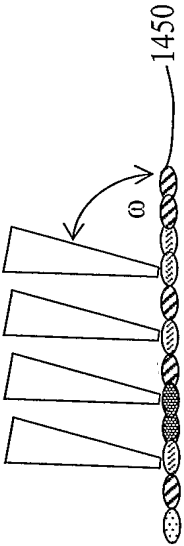


FIGURE 14E

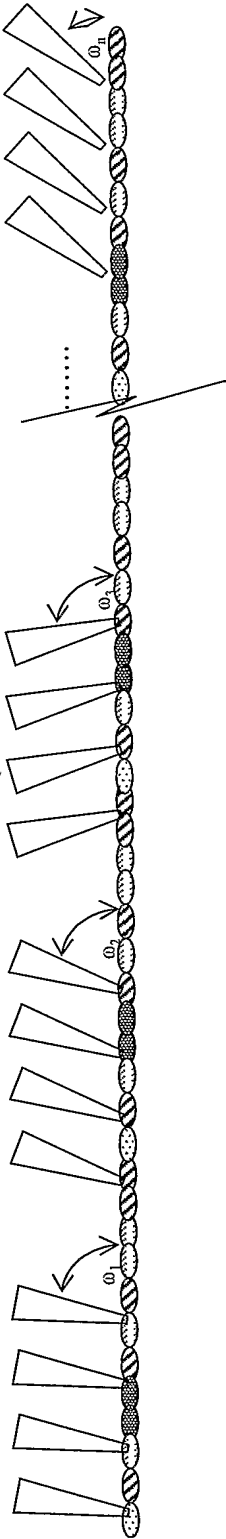


FIGURE 14F

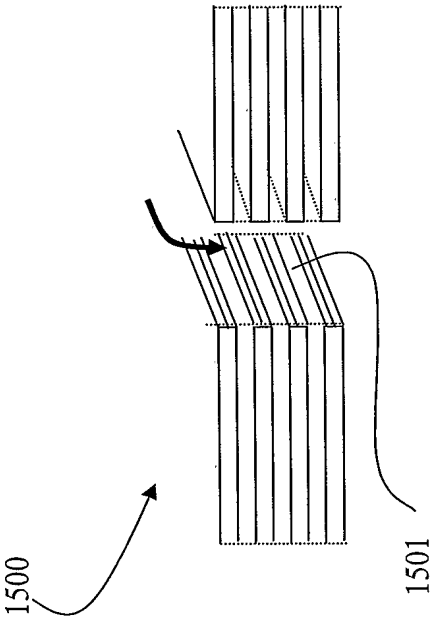


FIGURE 15A

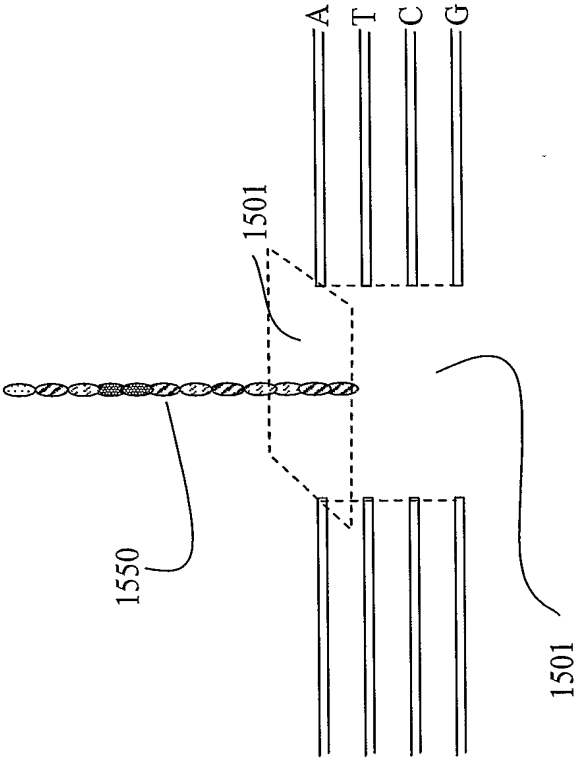


FIGURE 15B

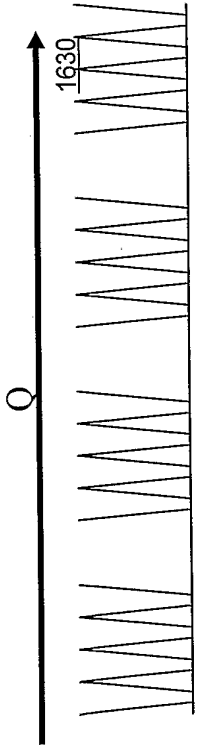


FIGURE 16A

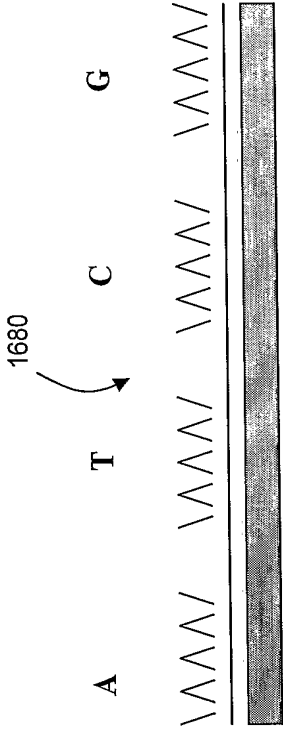


FIGURE 16C

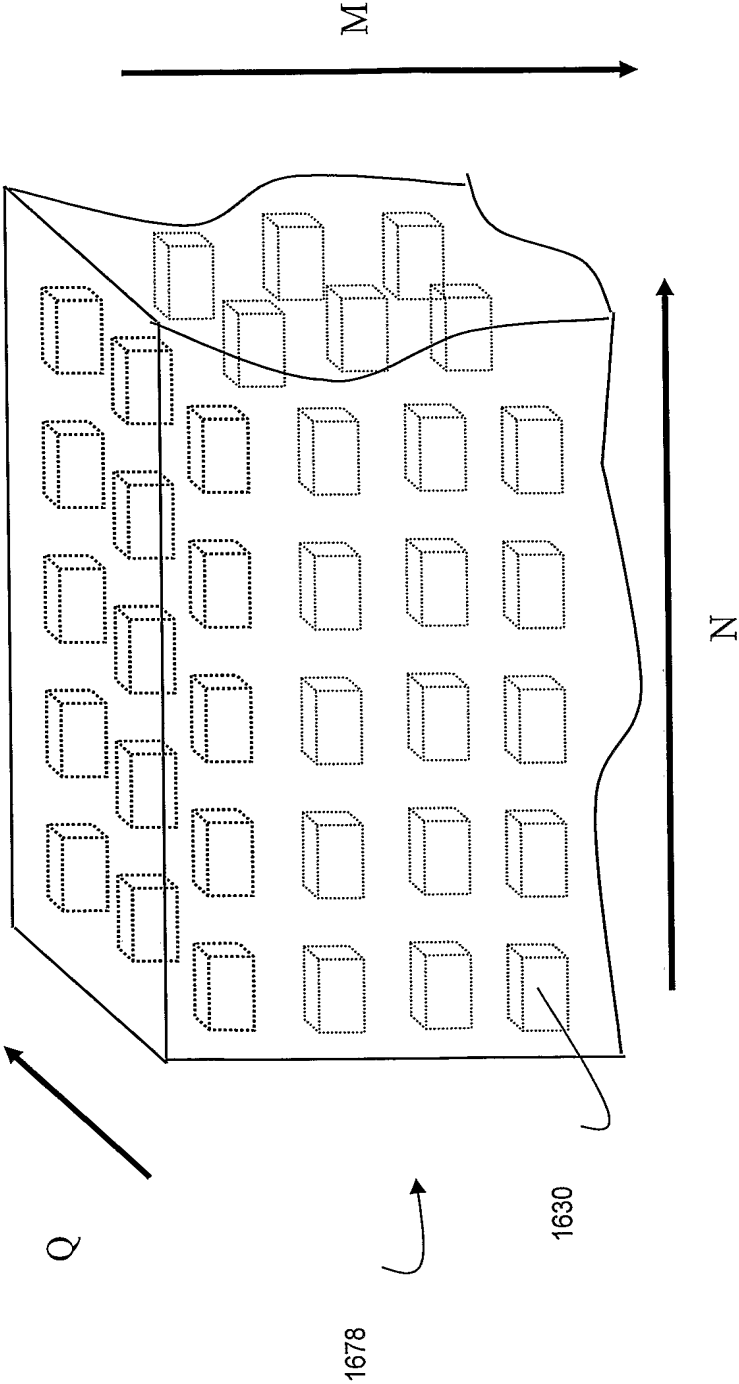
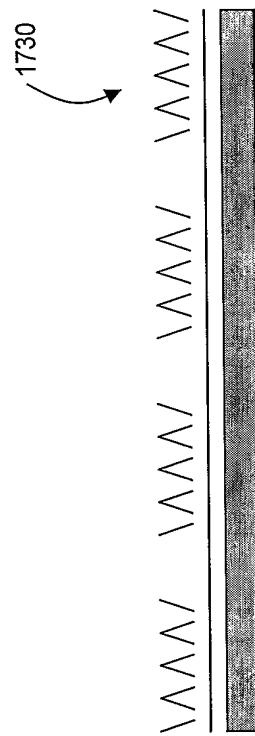
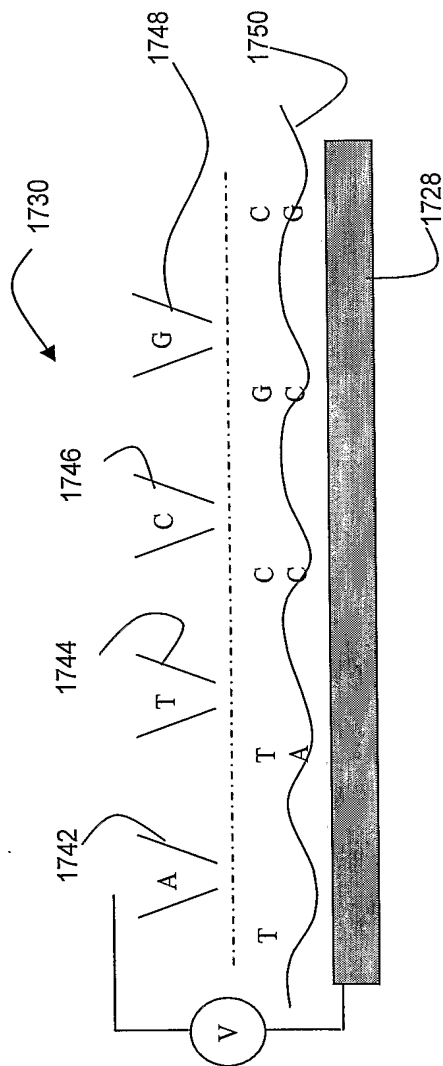


FIGURE 16B



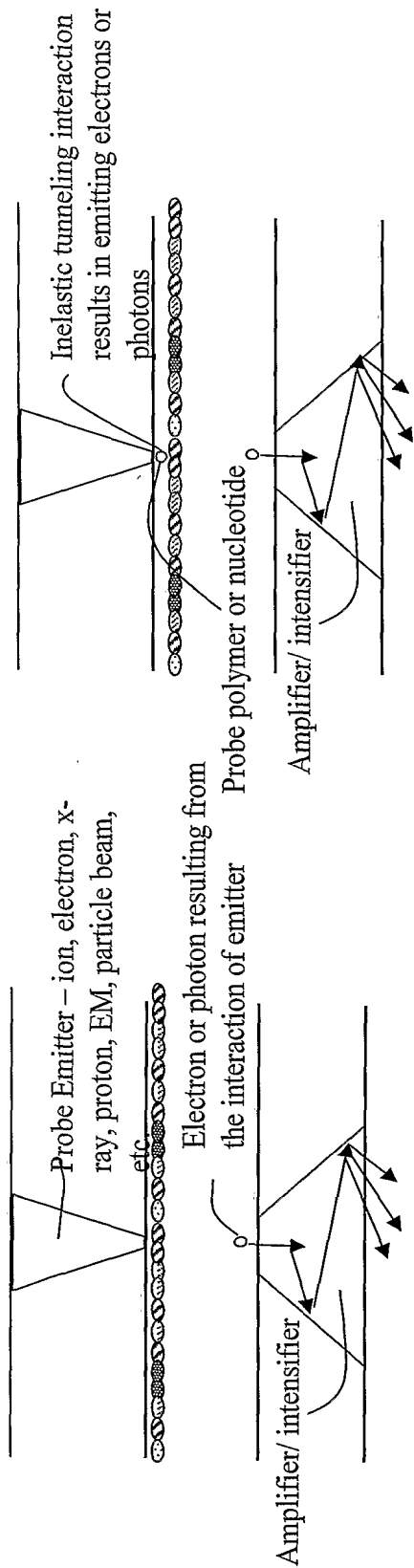
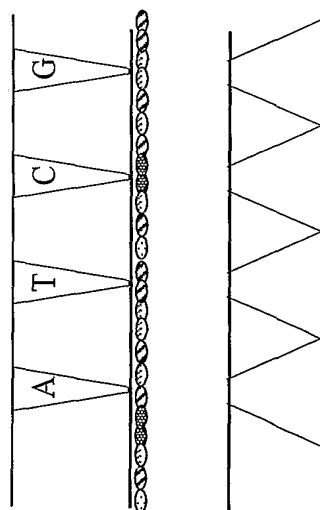


FIGURE 16A

FIGURE 16B

Emission



One or multiple
E-intensifiers

FIGURE 16C

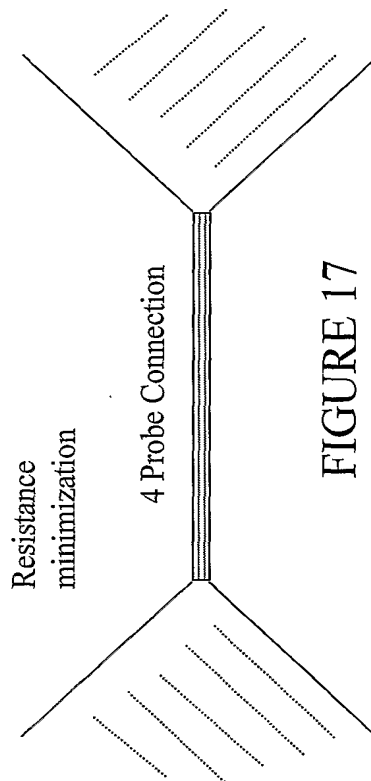


FIGURE 17

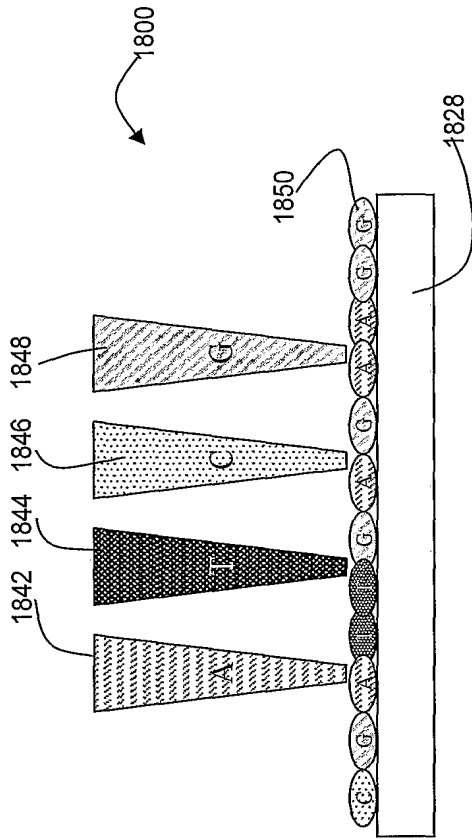


FIGURE 18A

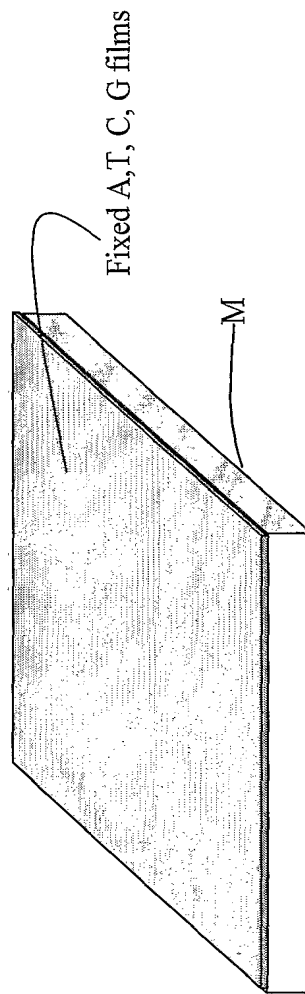


FIGURE 18B

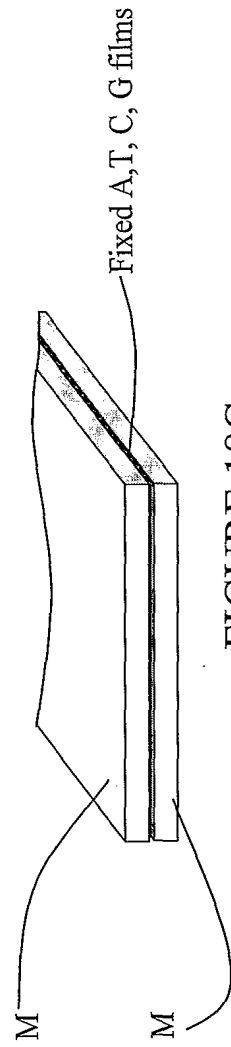


FIGURE 18C

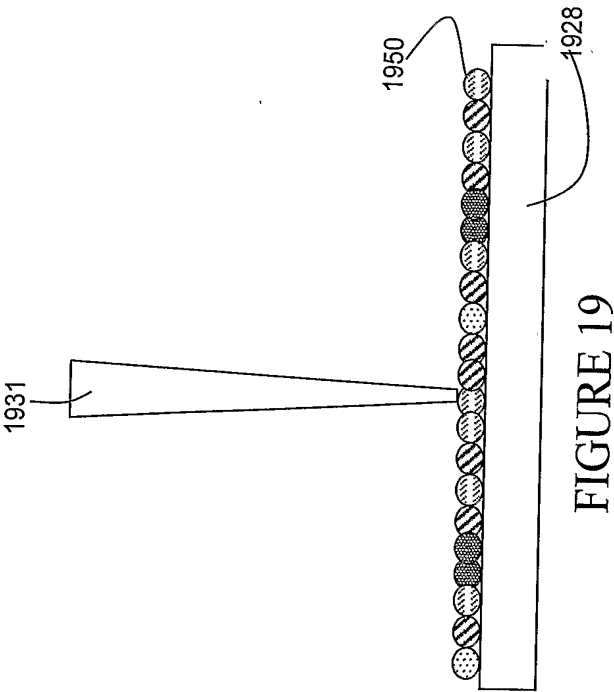


FIGURE 19

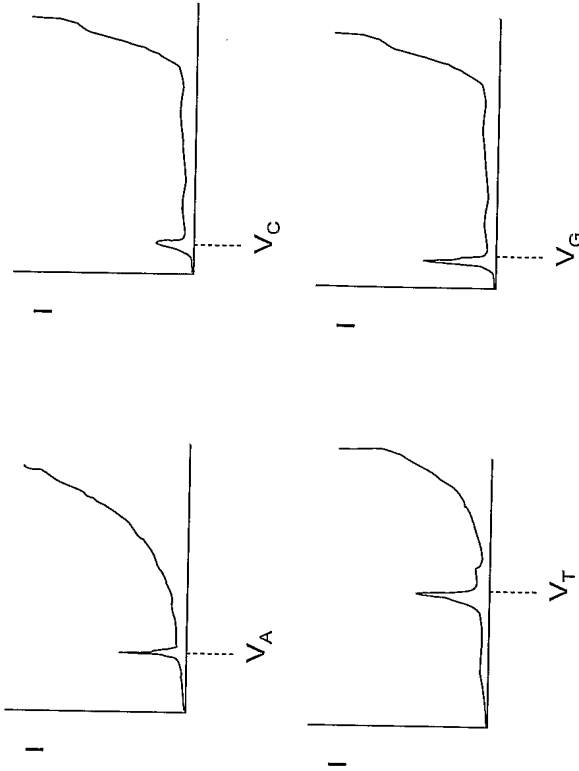


FIGURE 20 21

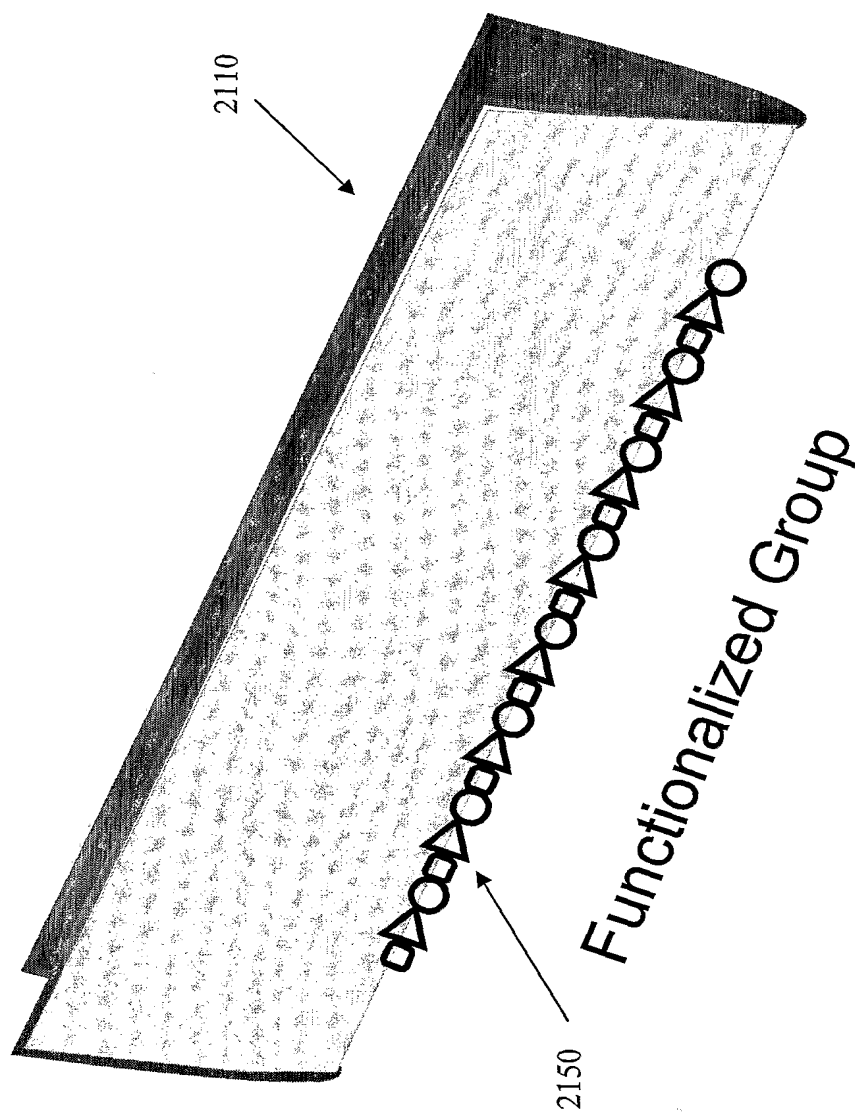


Figure 21

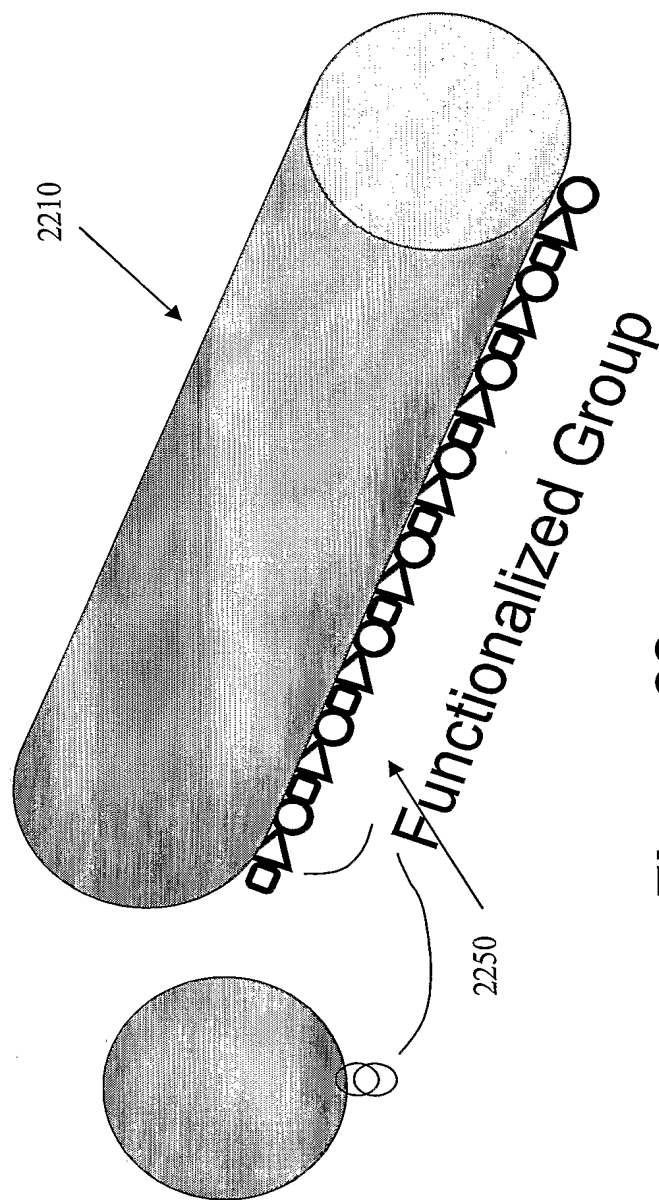


Figure 22

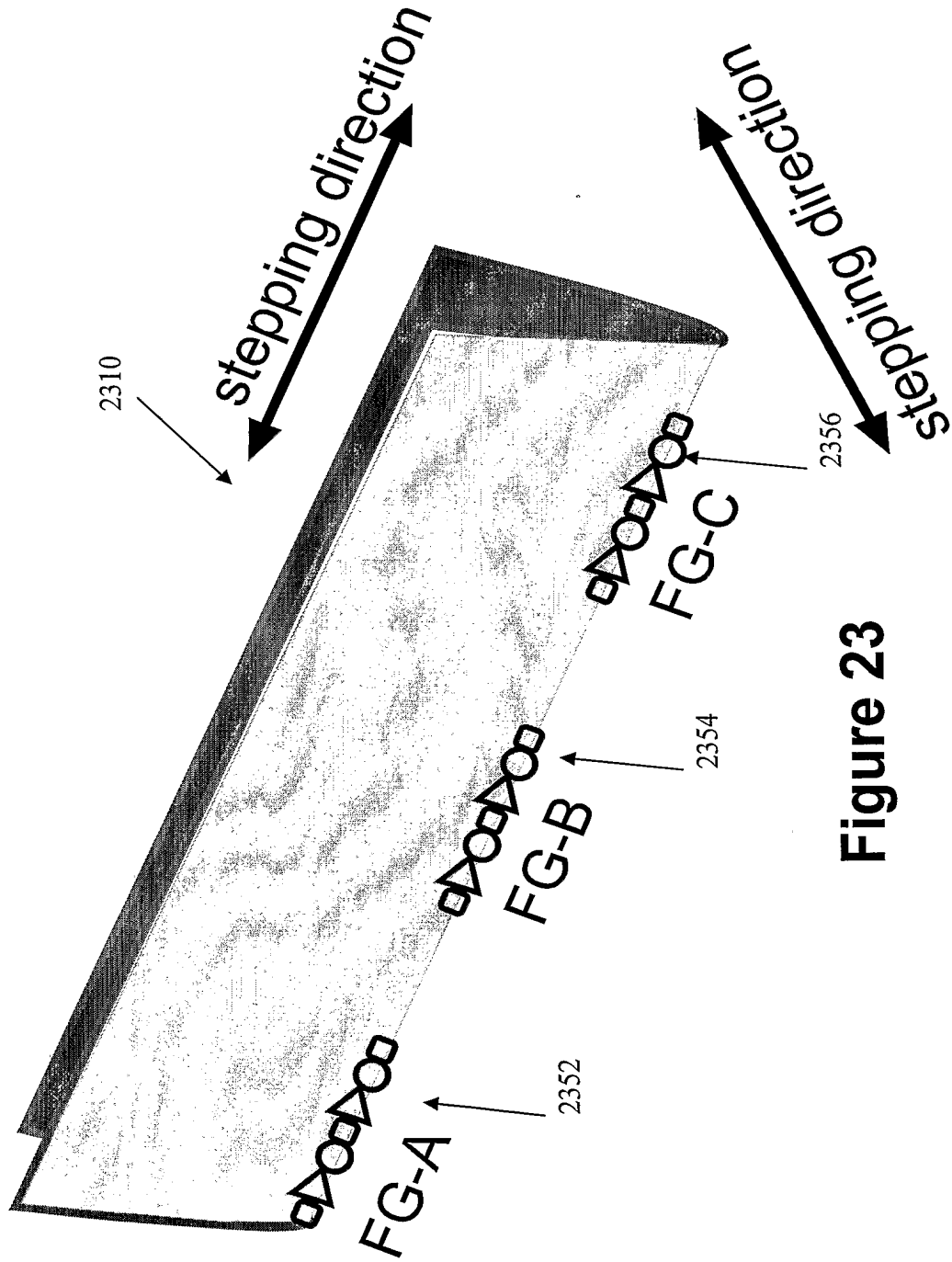


Figure 23

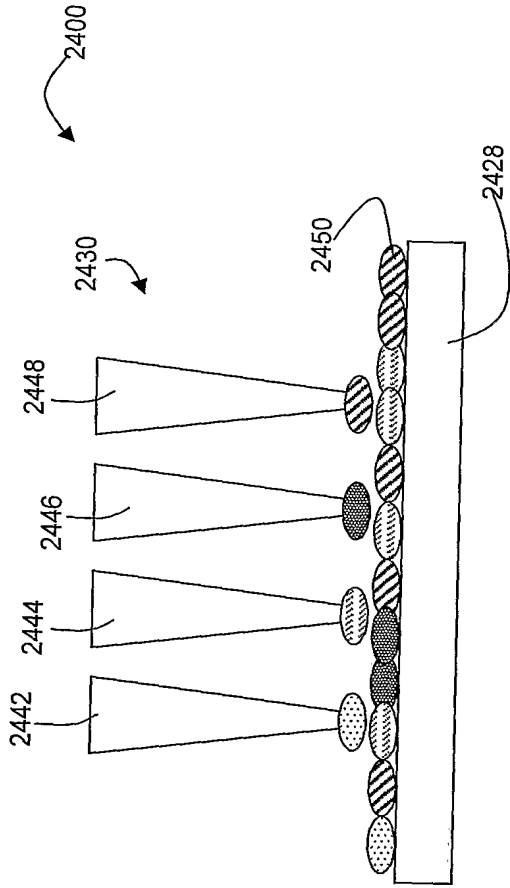


FIGURE 24A

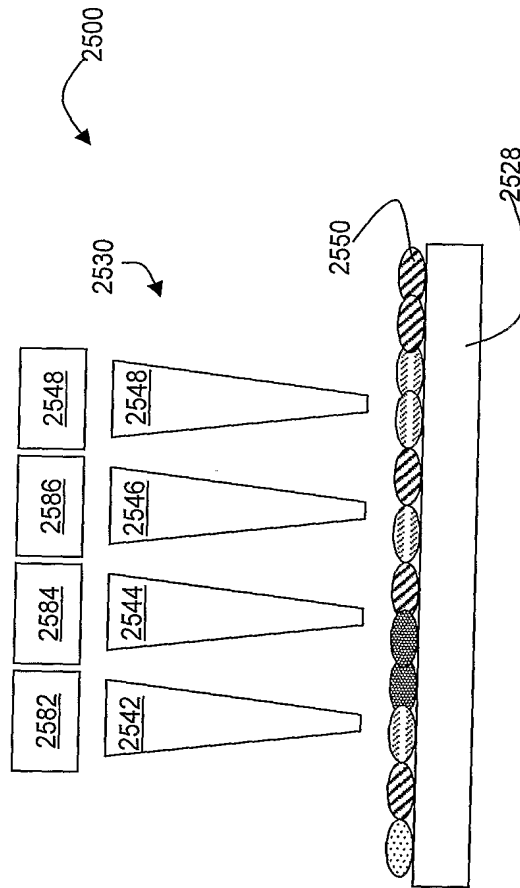


FIGURE 25

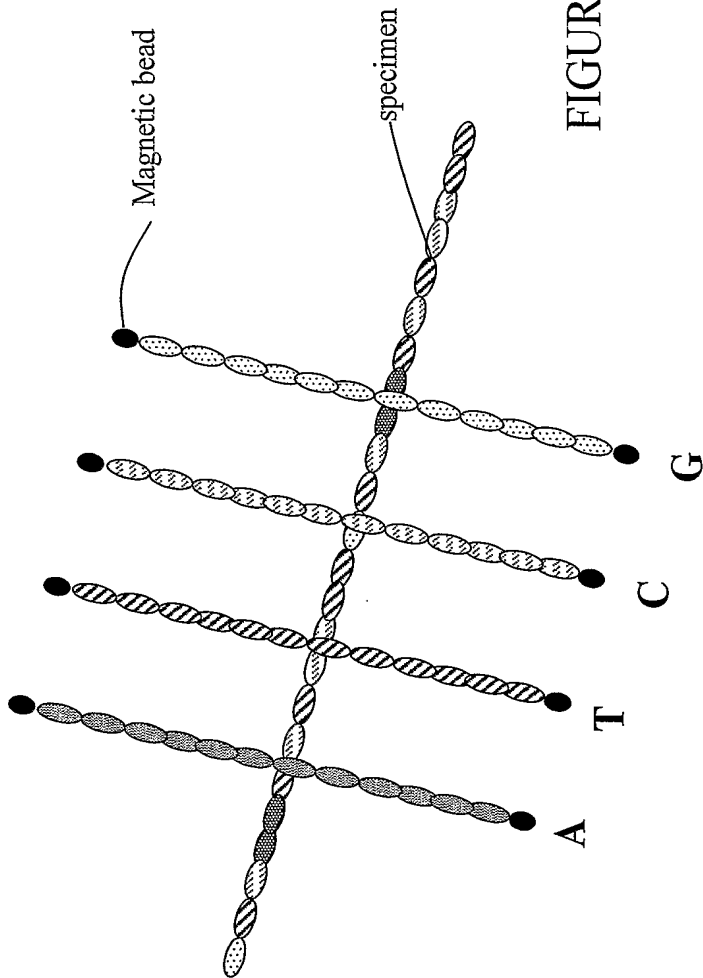


FIGURE 24B

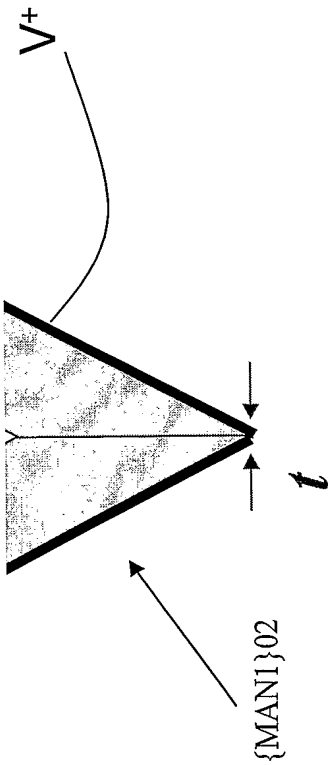


Figure {MAN1}

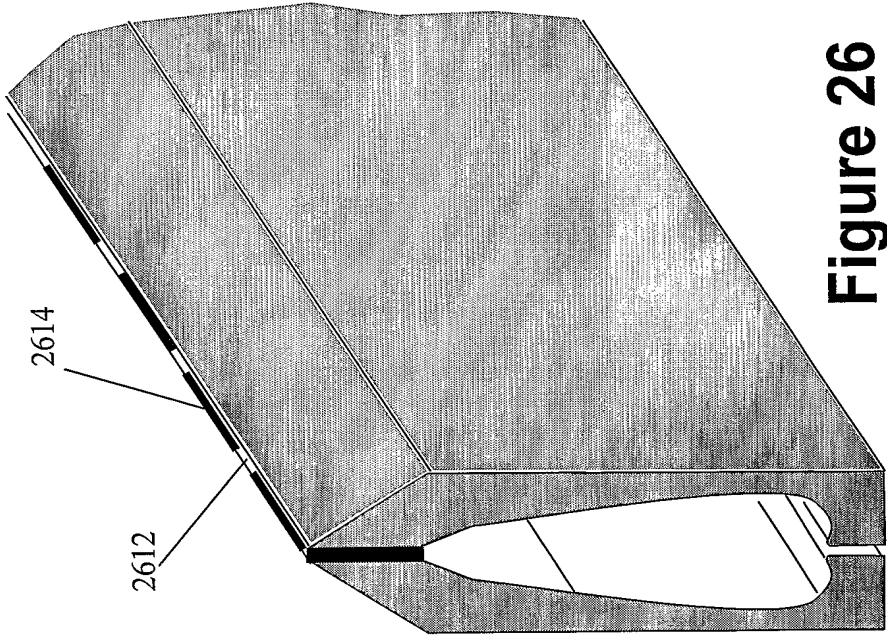


Figure 26

Figure 27A

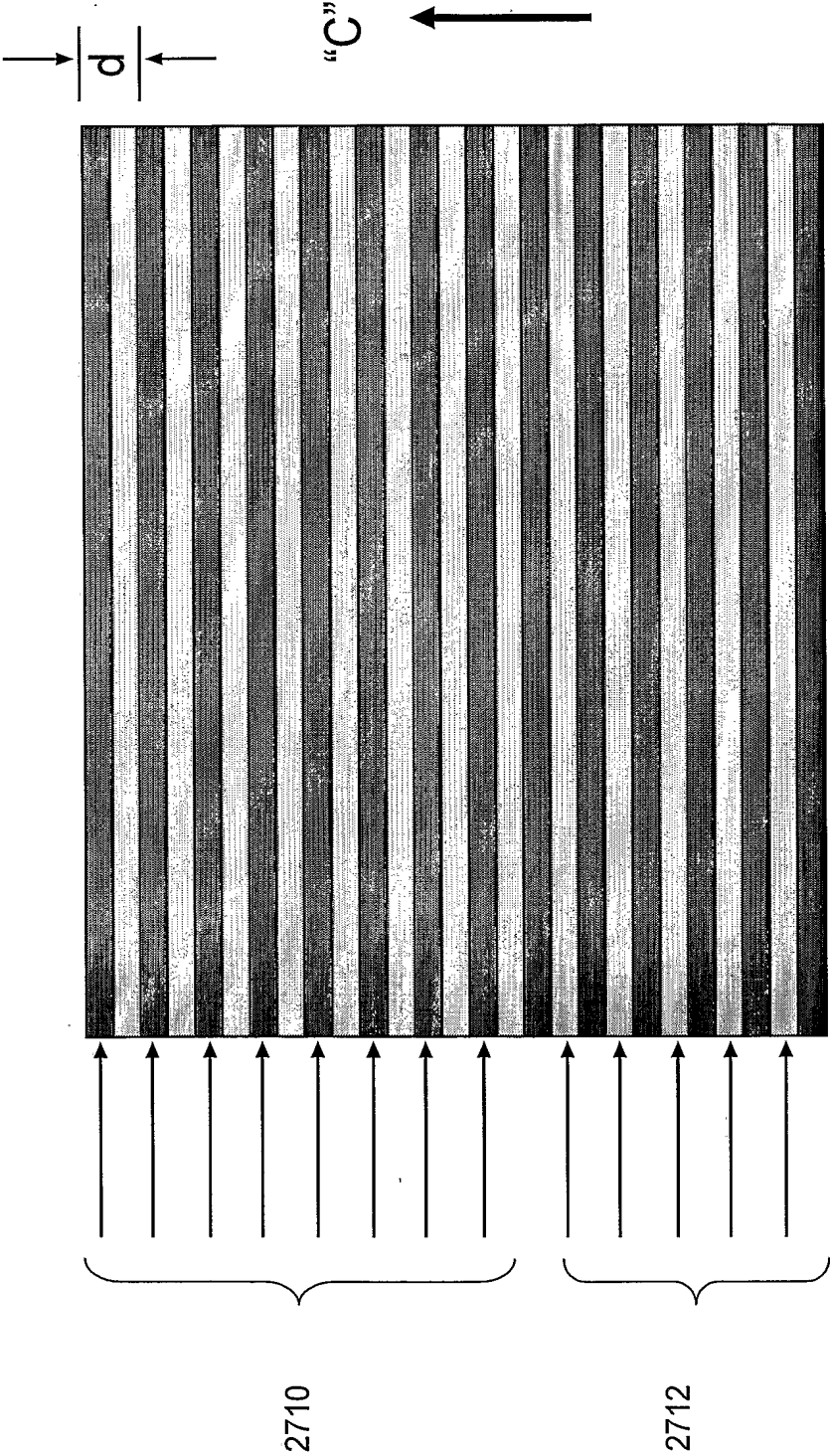


Figure 27B

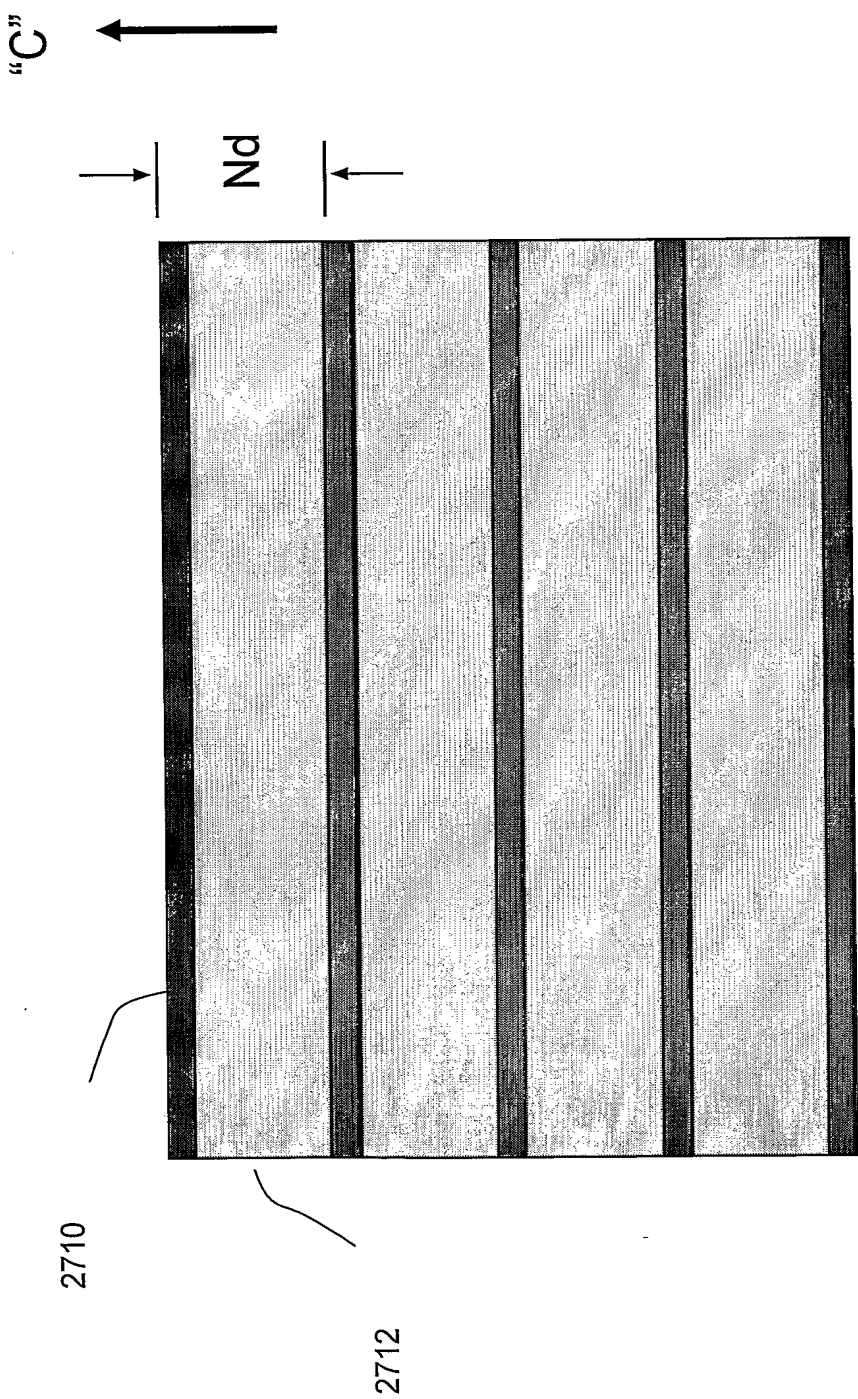


Figure 28A

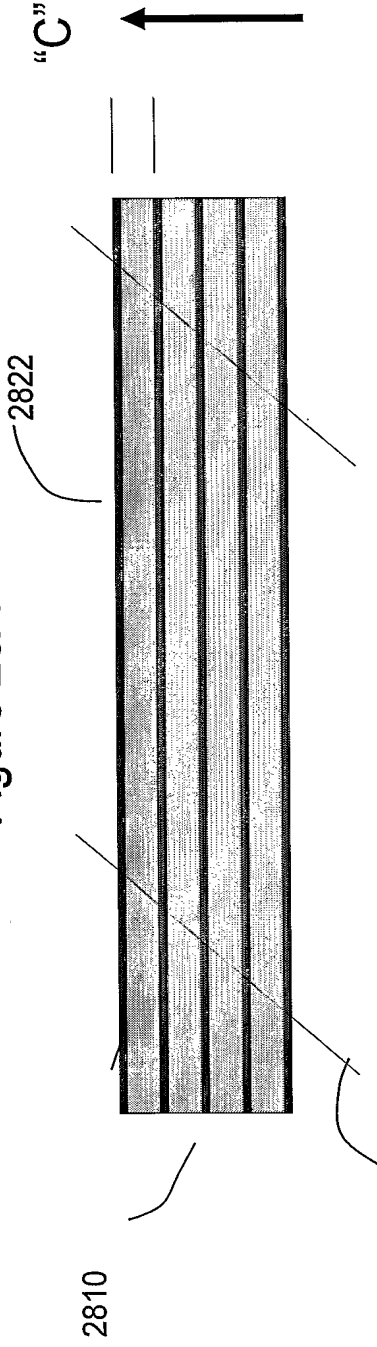


Figure 28B

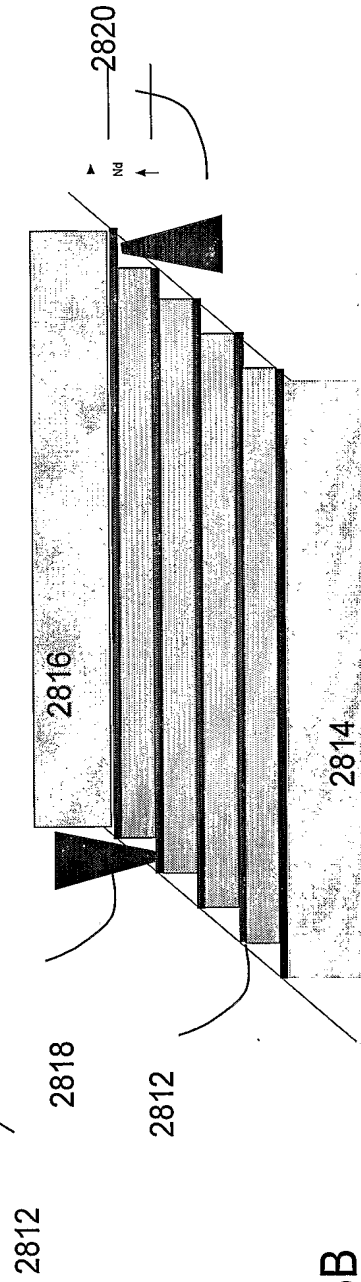


Figure 28C

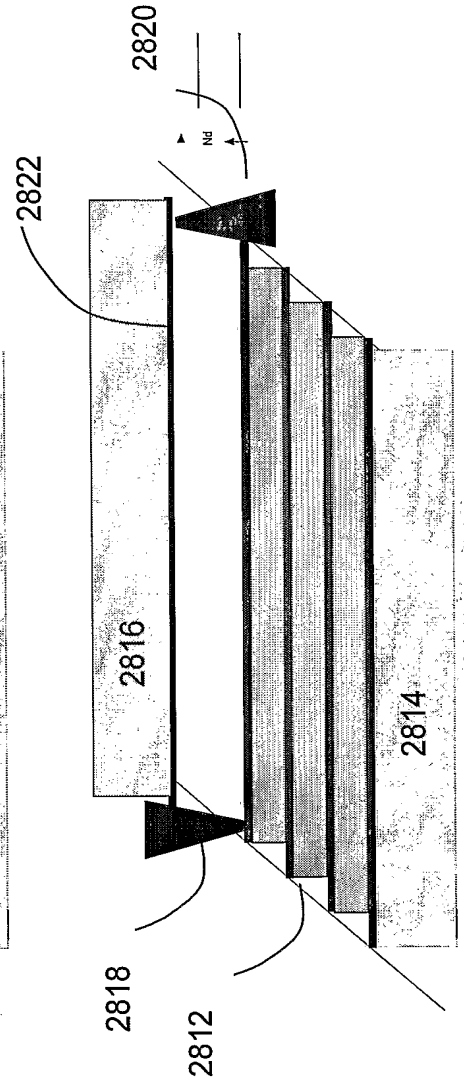


Figure 28D

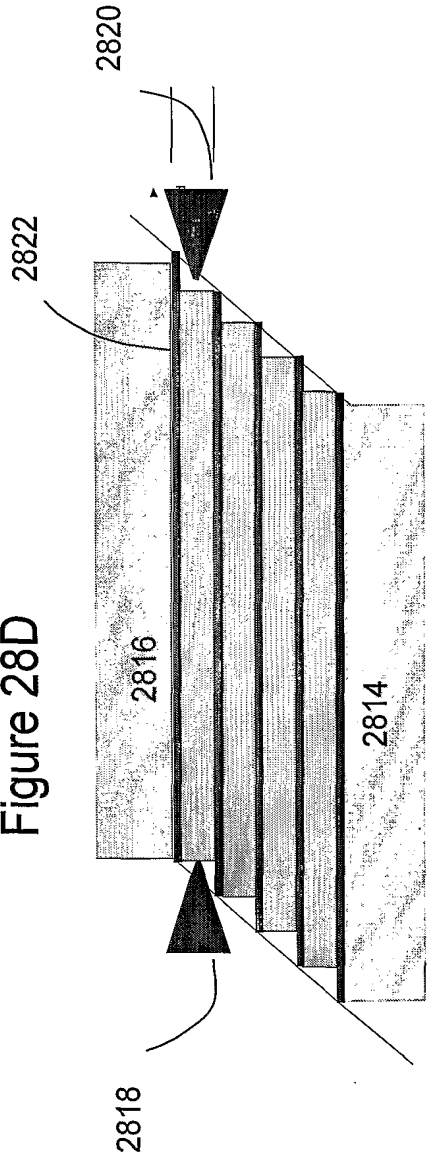


Figure 28E

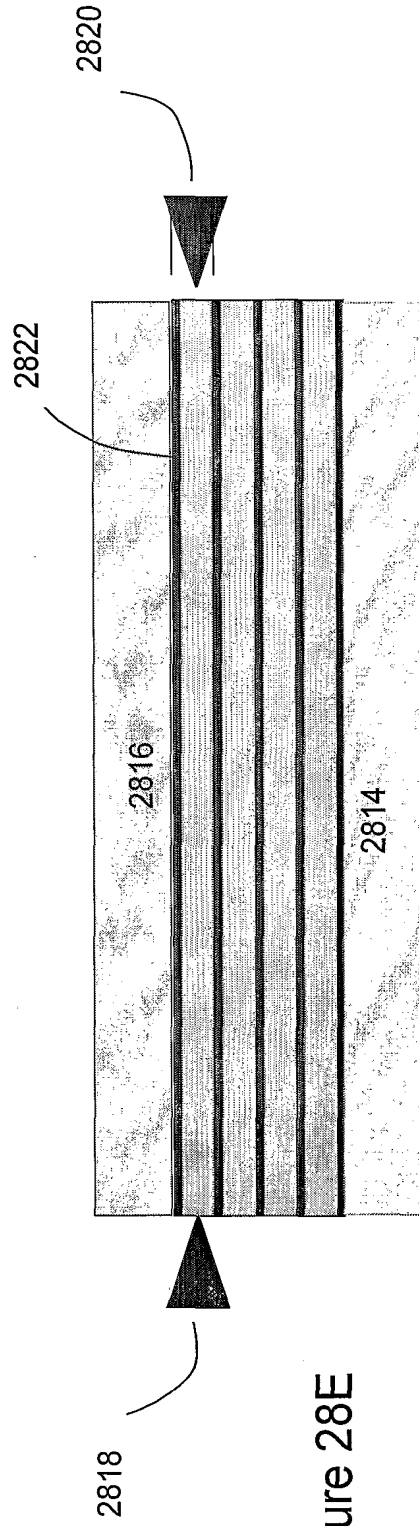
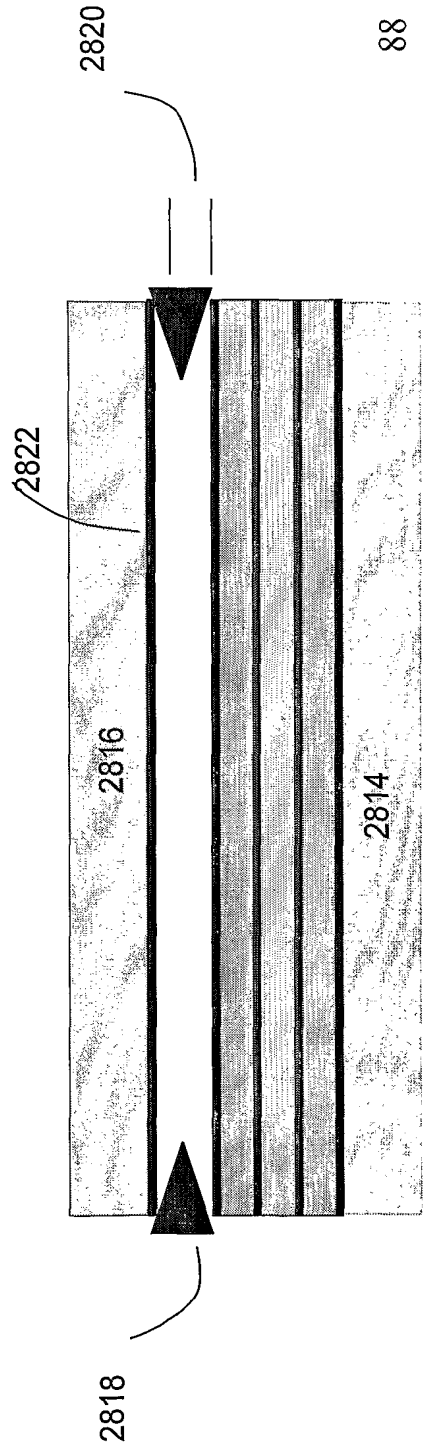


Figure 28F



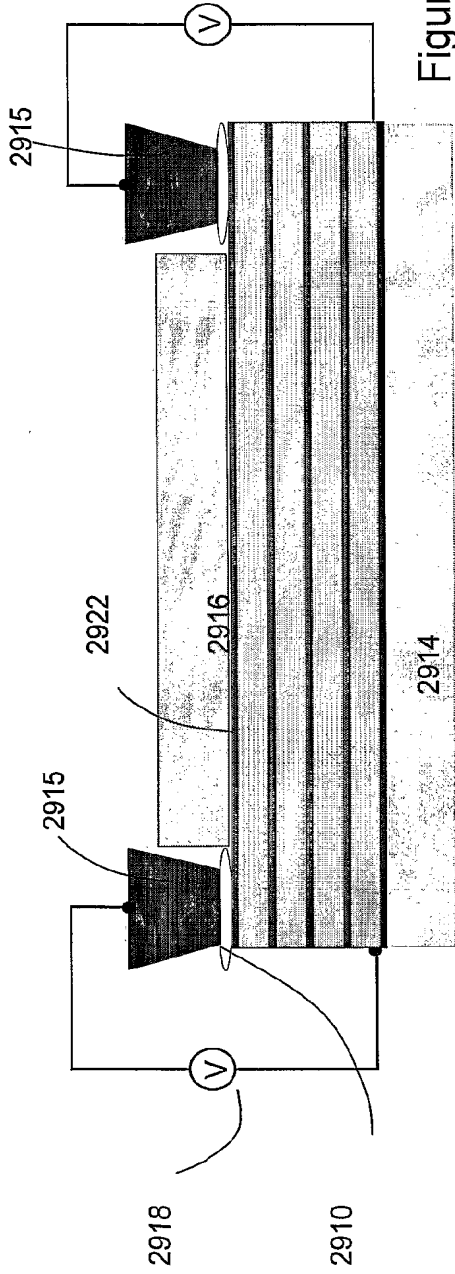


Figure 29A

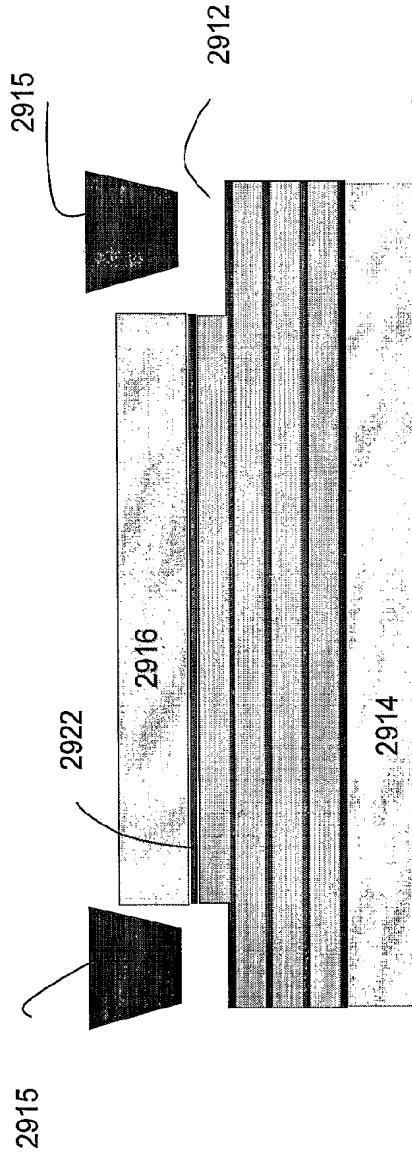


Figure 29B

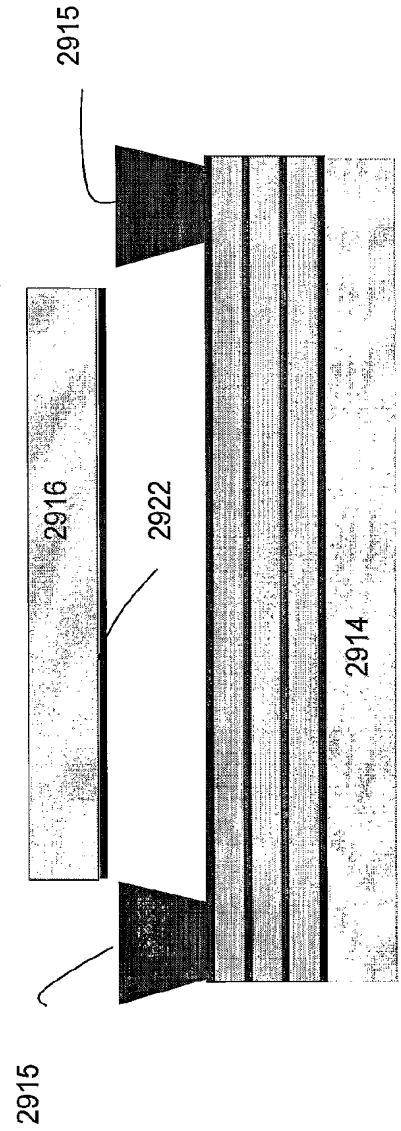


Figure 29C

Figure 30A

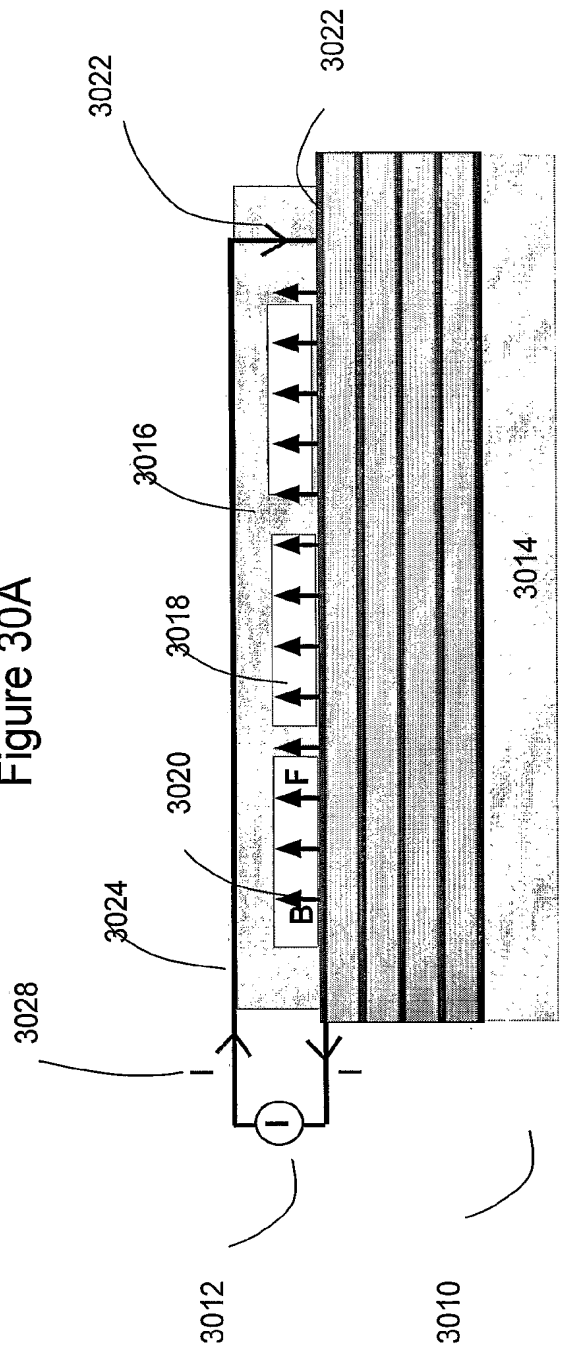


Figure 30B

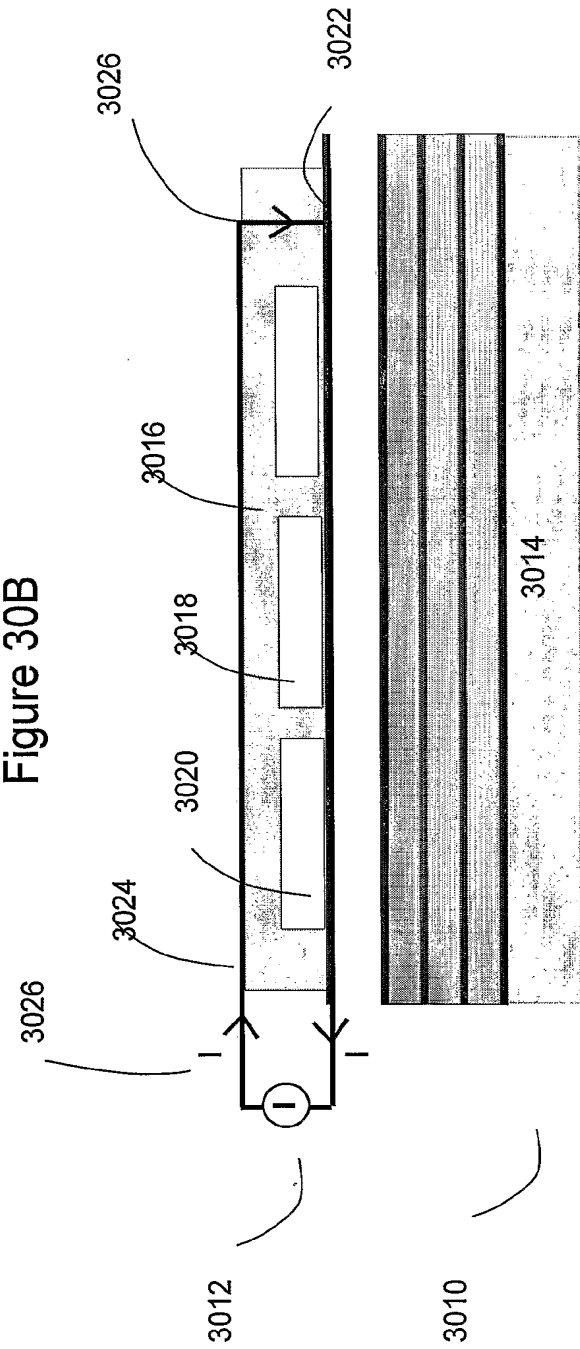


Figure 31A

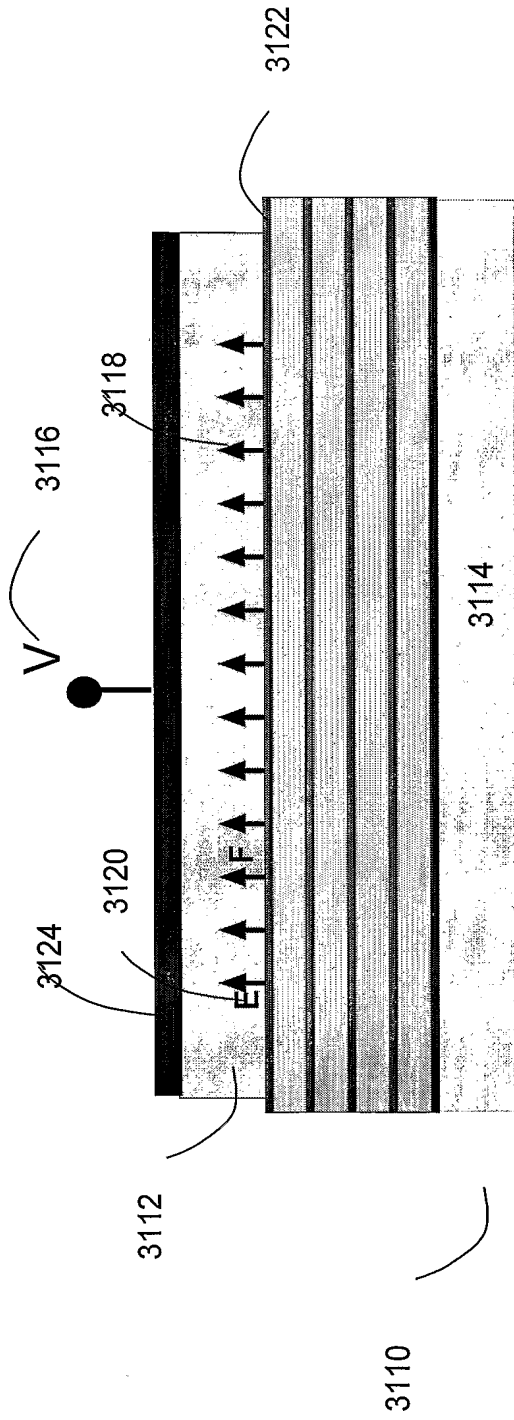
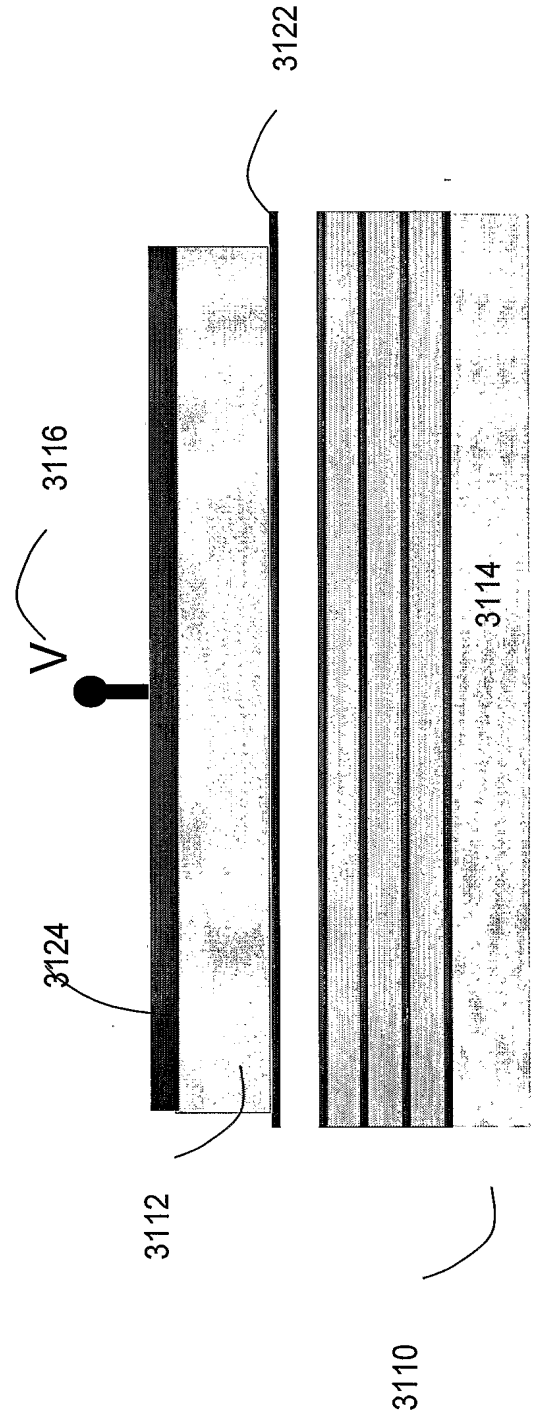


Figure 31B



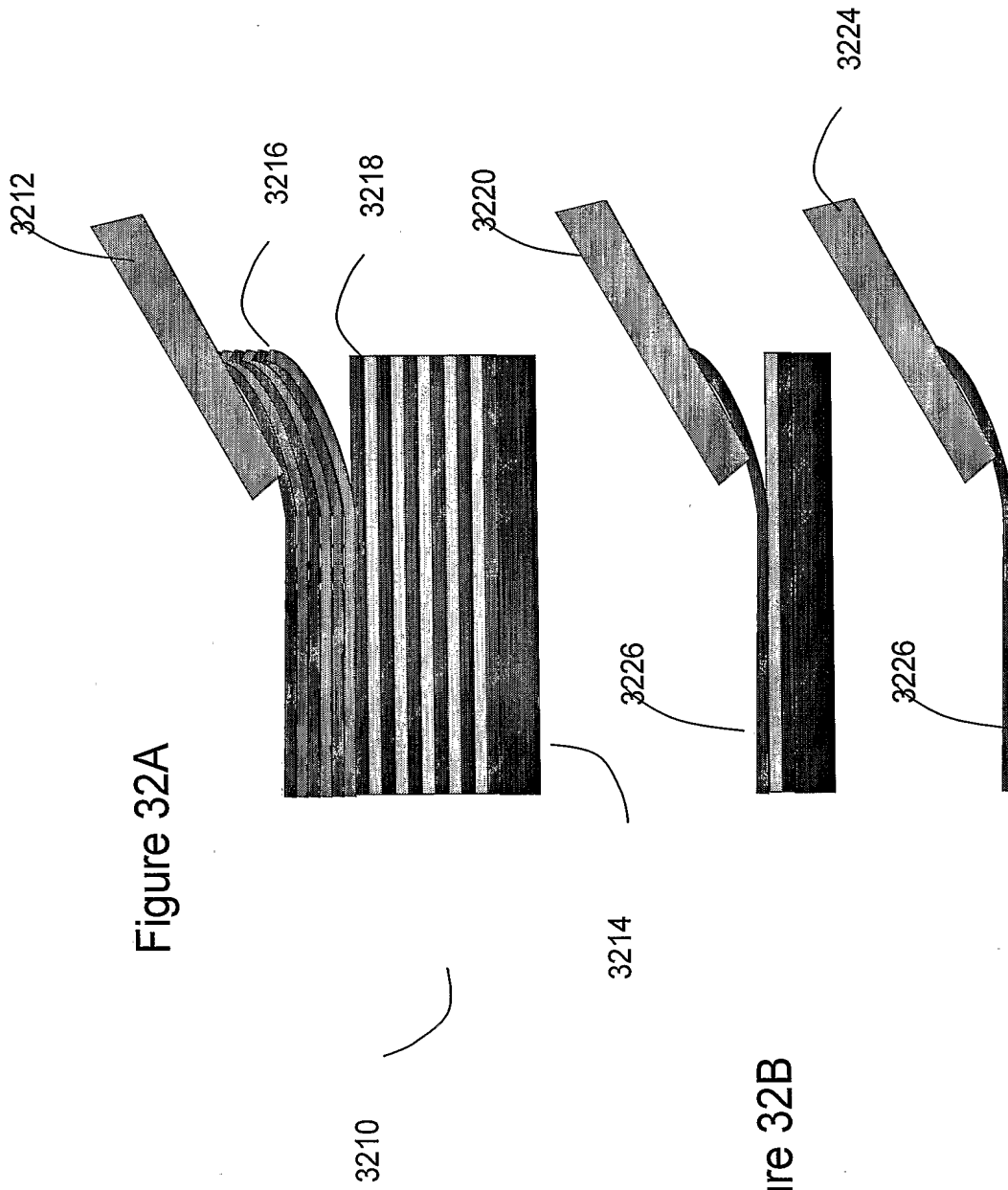


Figure 32B

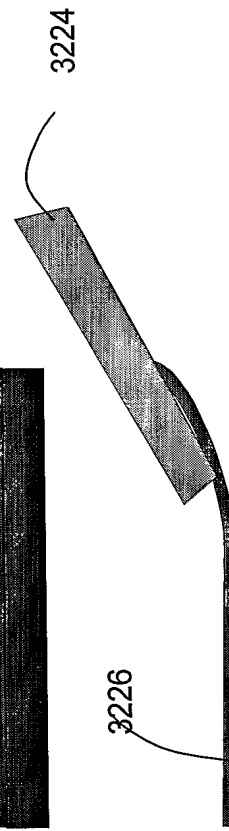
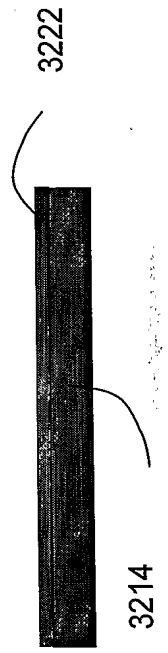


Figure 32C



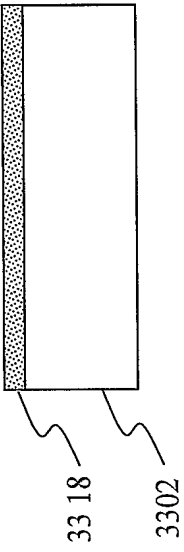


Figure 33B

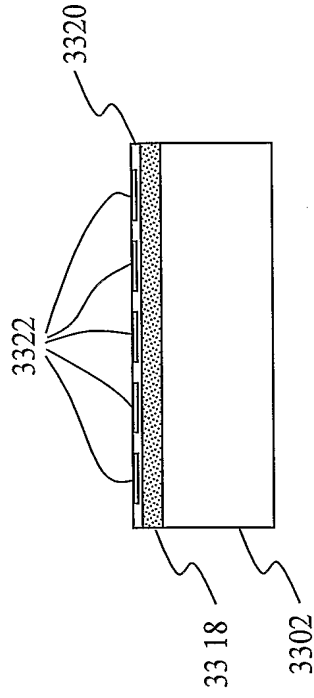


Figure 33C

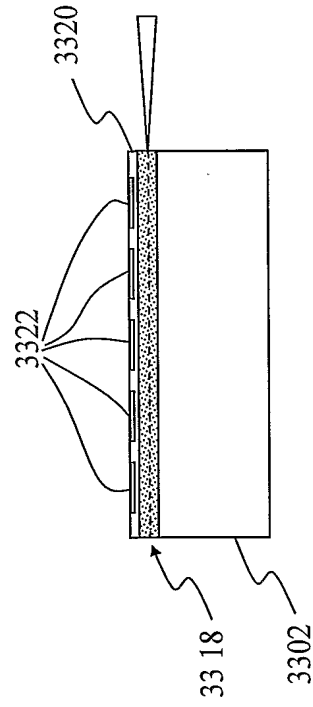


Figure 33D

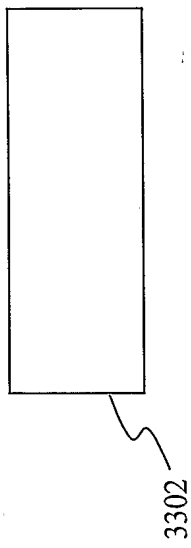


Figure 33E

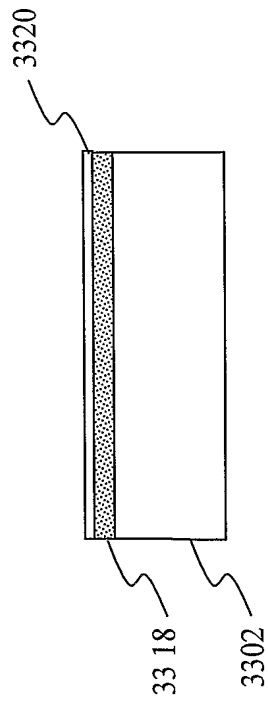


Figure 33F

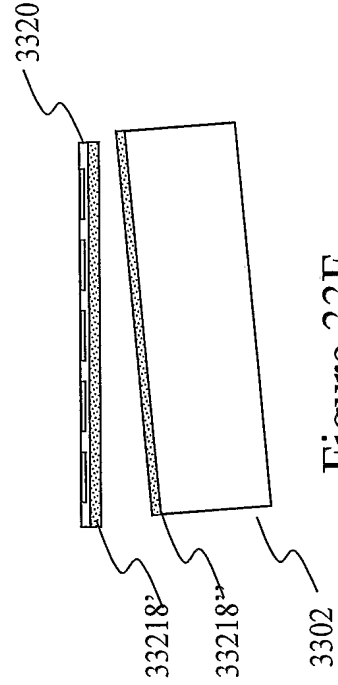


Figure 33G

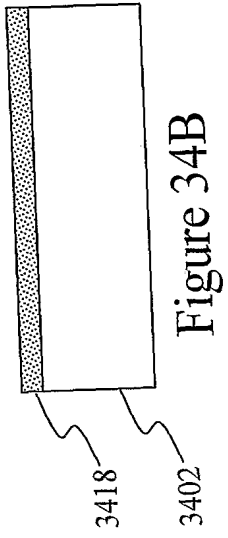


Figure 34A

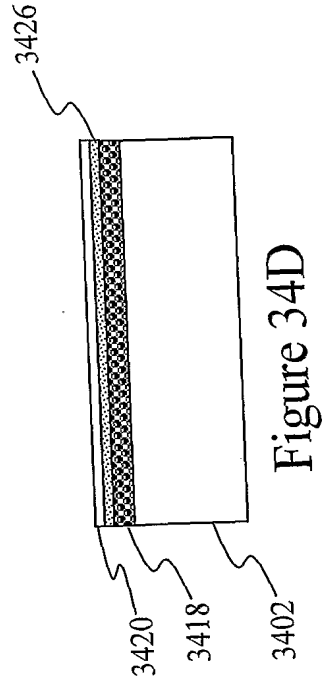


Figure 34B

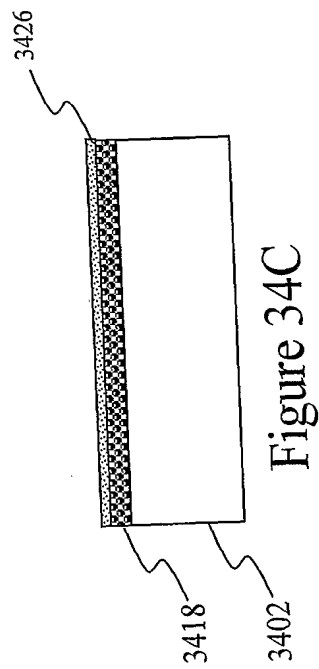


Figure 34C

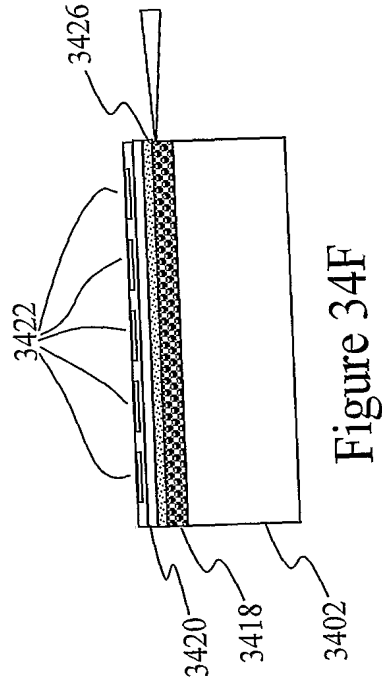


Figure 34D

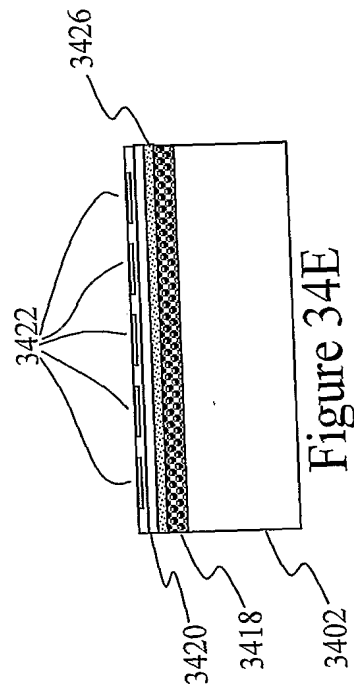


Figure 34E

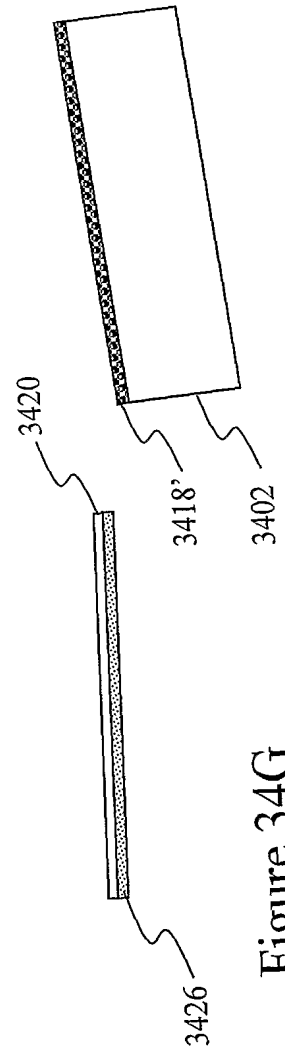


Figure 34F

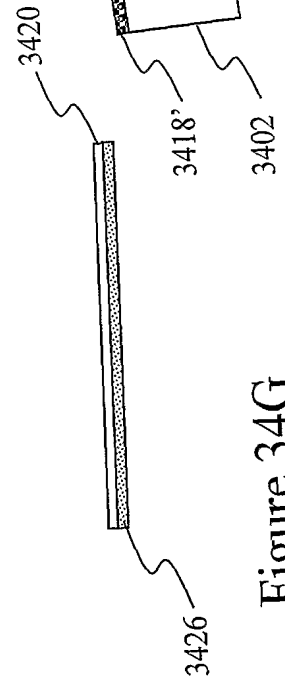


Figure 35A

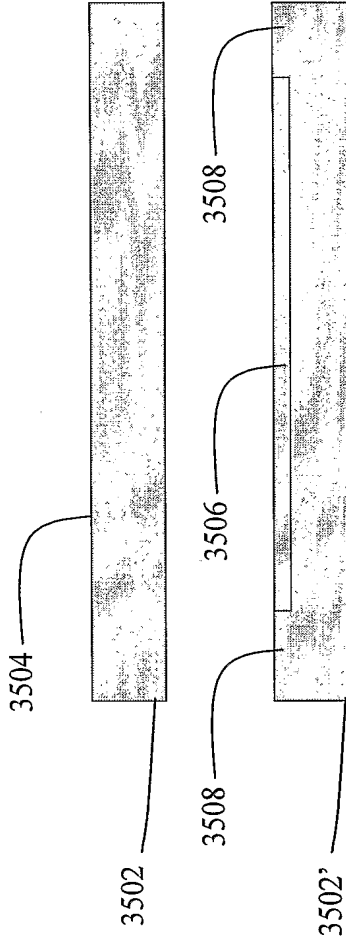


Figure 35B

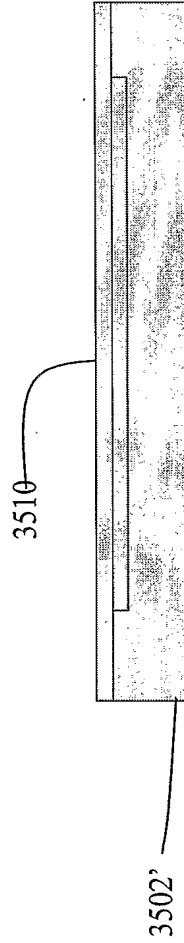


Figure 35C

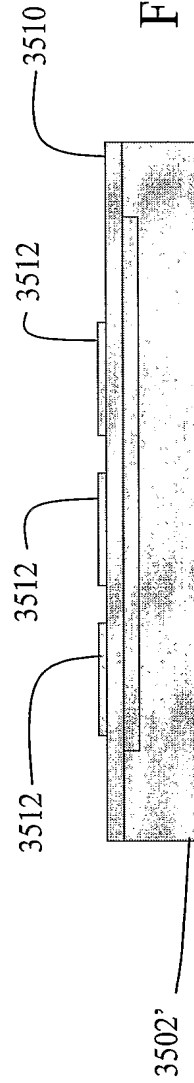


Figure 35D

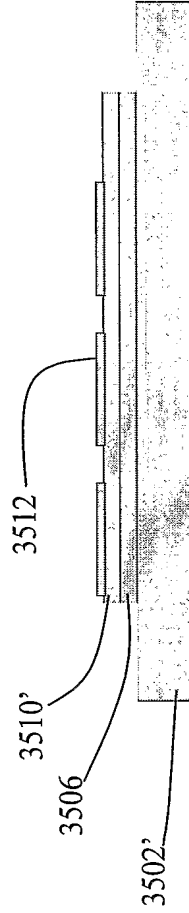


Figure 35E

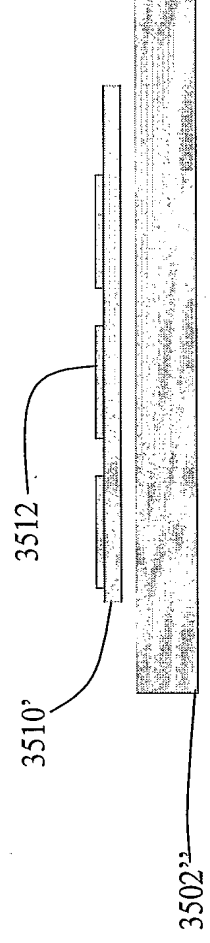


Figure 35F

Renumber 36

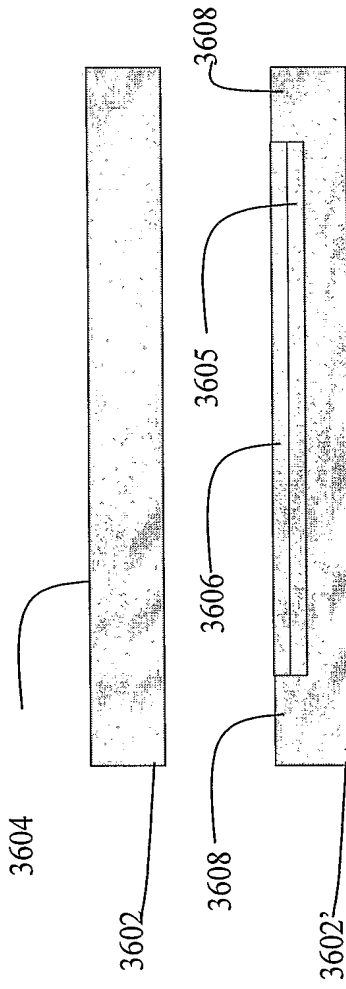


Figure 36A

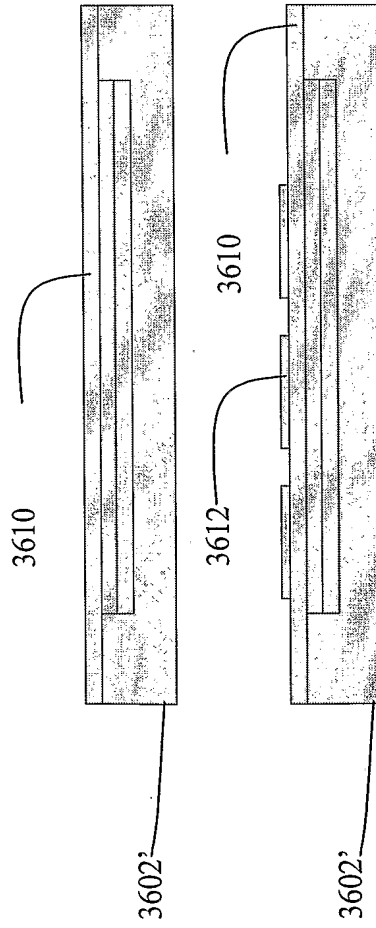


Figure 36B

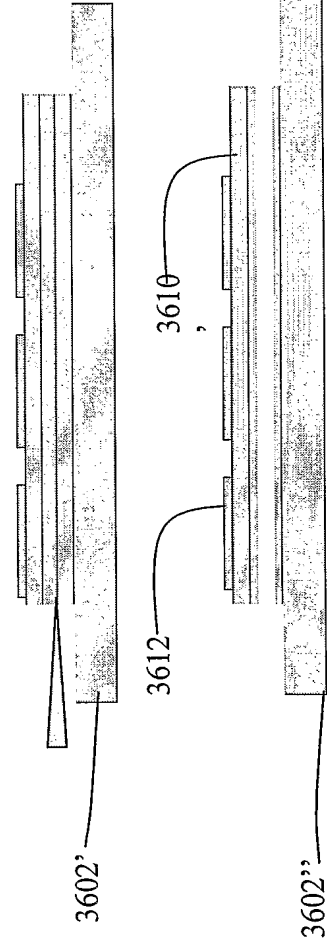


Figure 36C

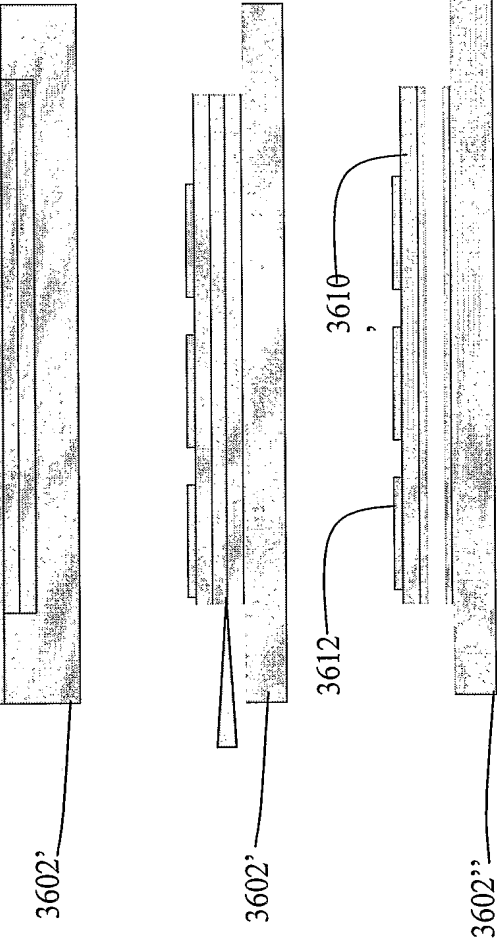


Figure 36D

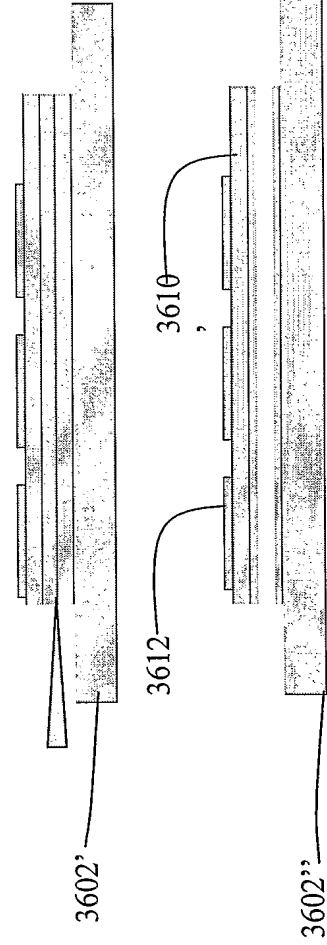


Figure 36E



Figure 36F

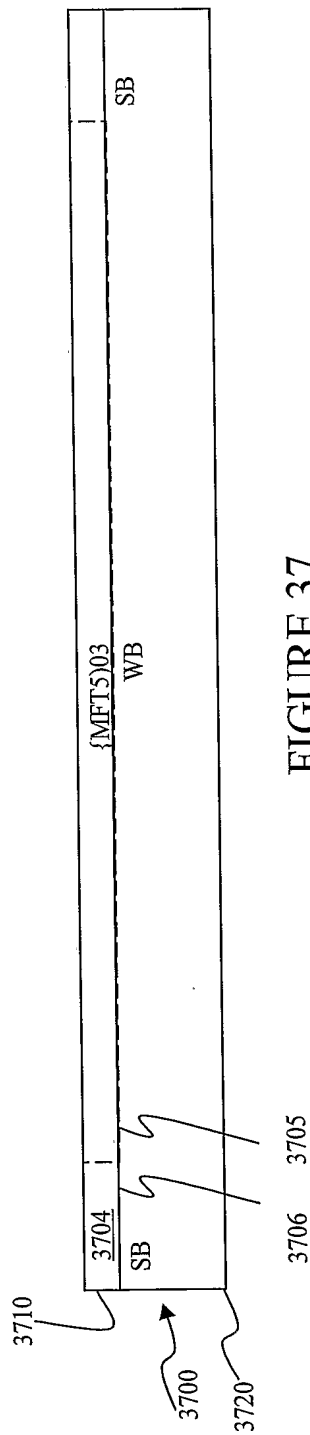


FIGURE 37

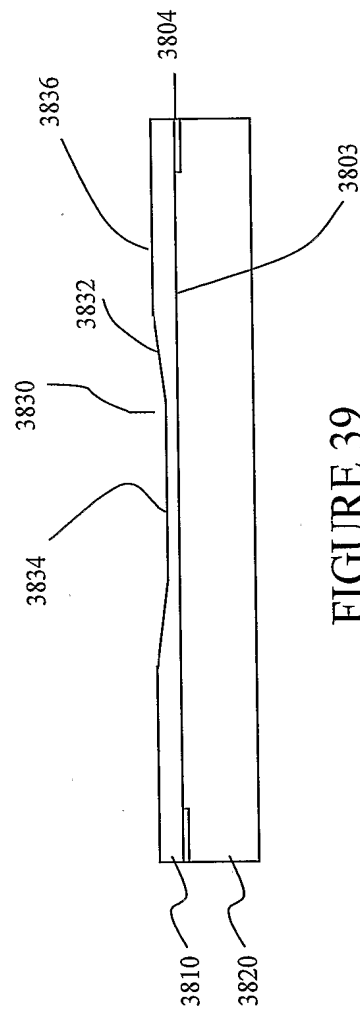


FIGURE 39

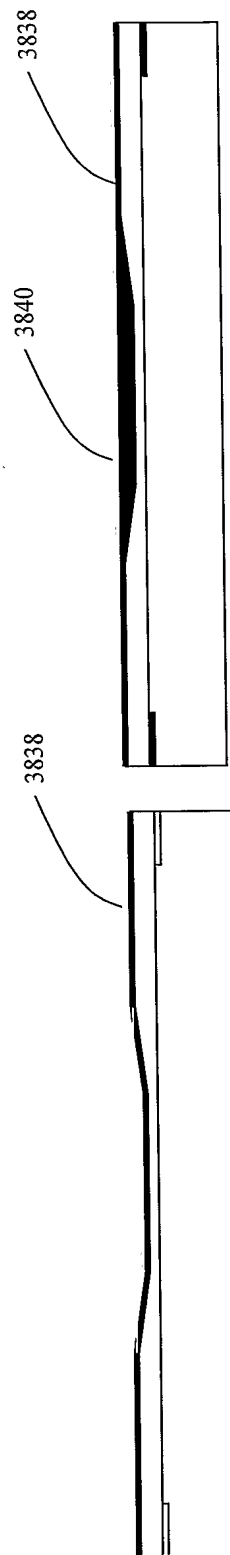


FIGURE 40B

FIGURE 40A



FIGURE 38B

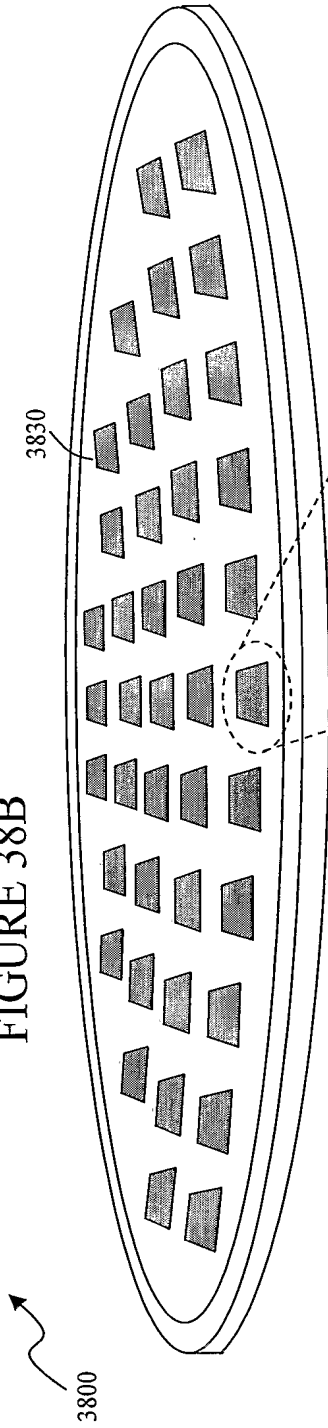


FIGURE 38A

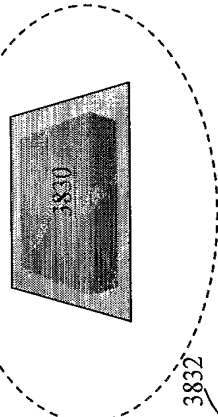


FIGURE 38C

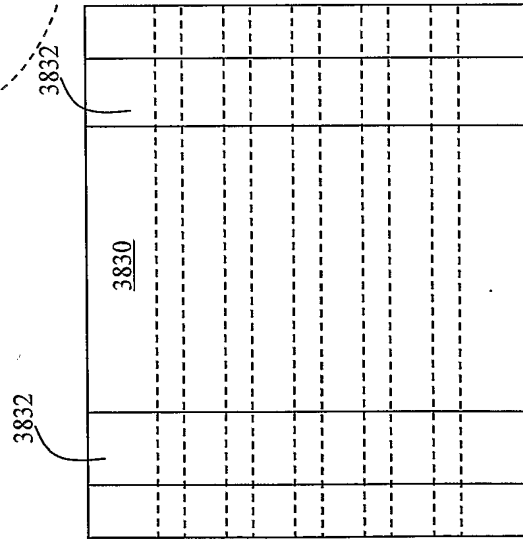
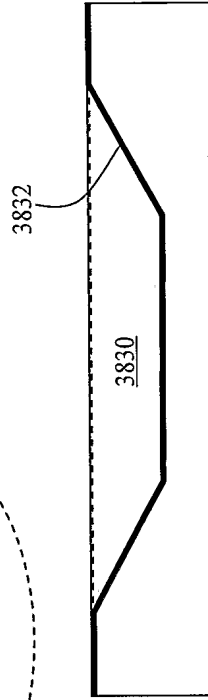


FIGURE 38D



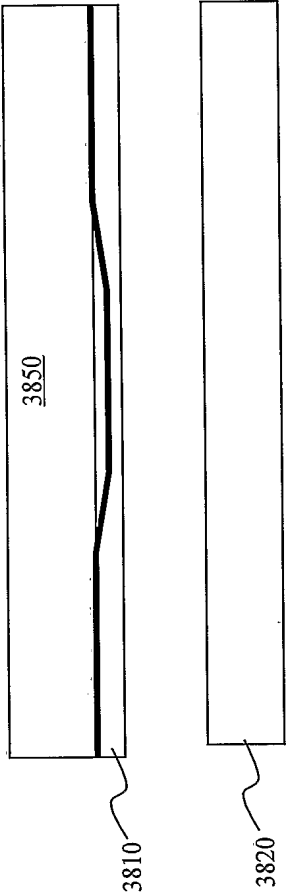


FIGURE 41

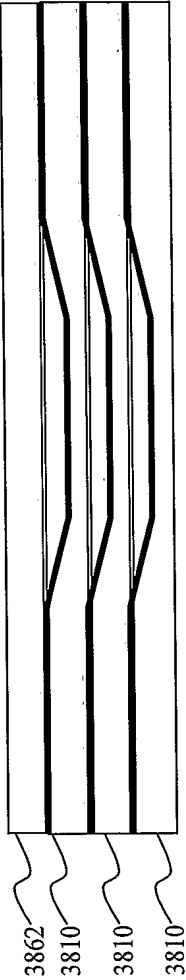


FIGURE 42

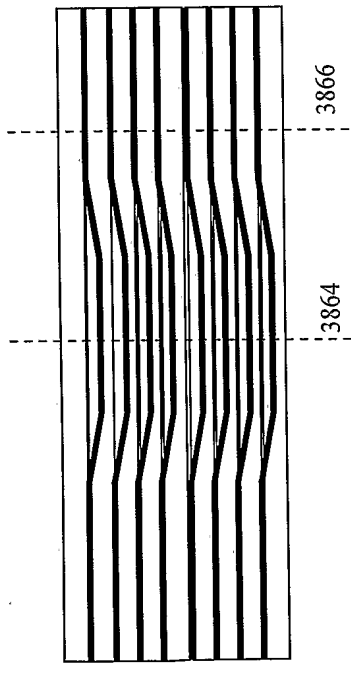


FIGURE 43

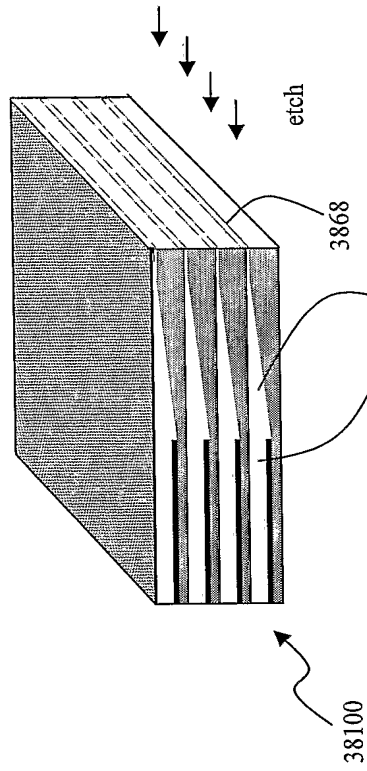


FIGURE 45

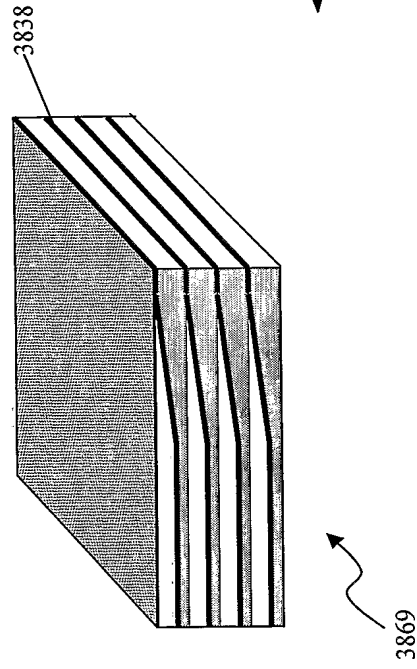


FIGURE 44

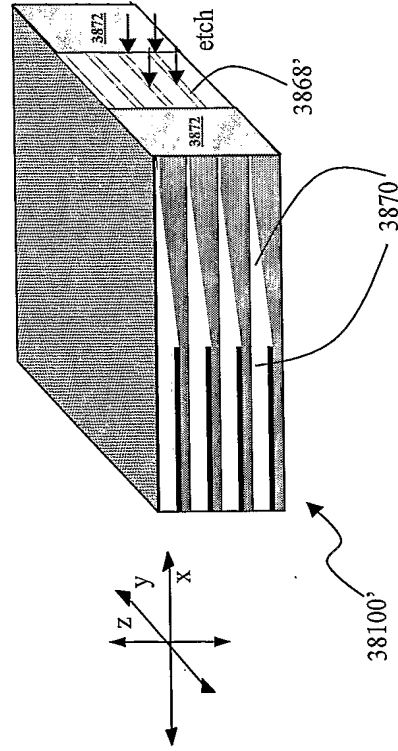
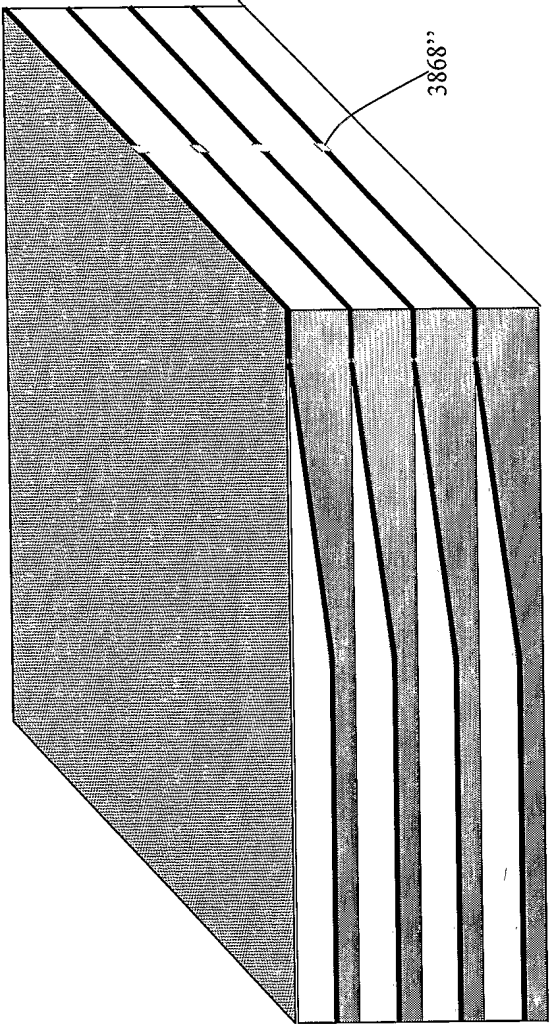
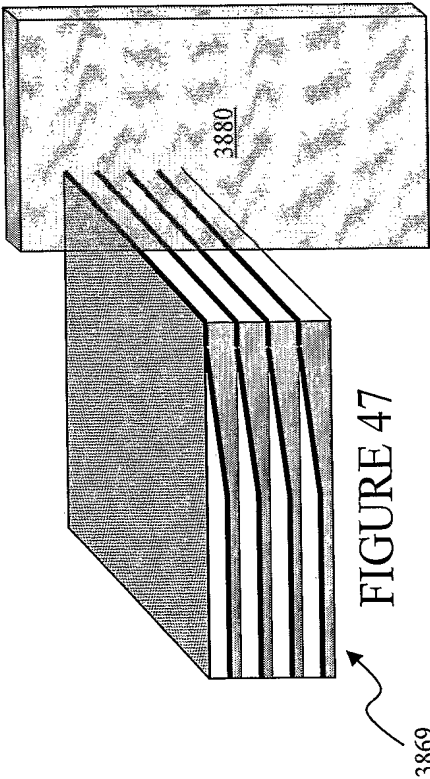


FIGURE 46



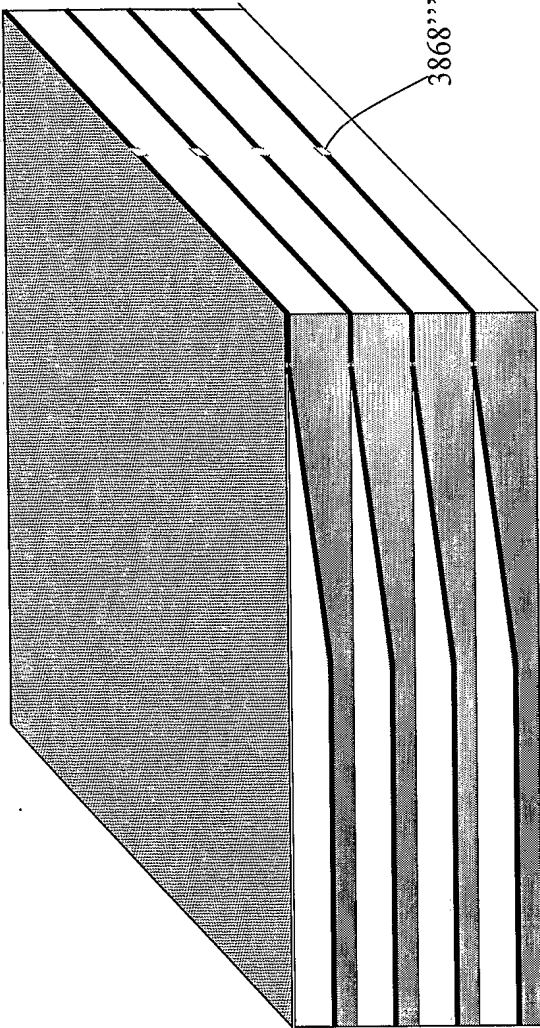
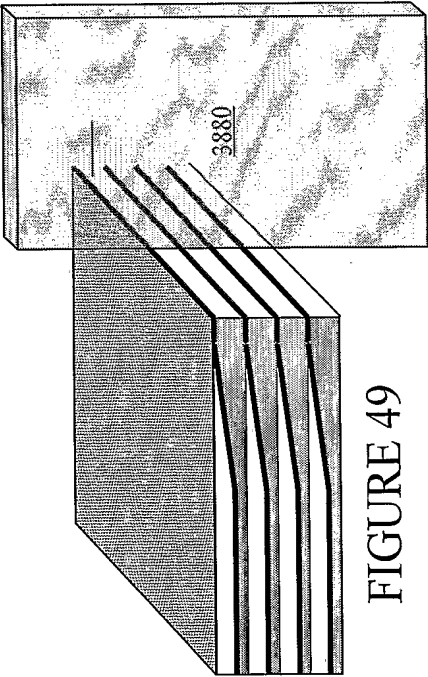


FIGURE 50

38100'''

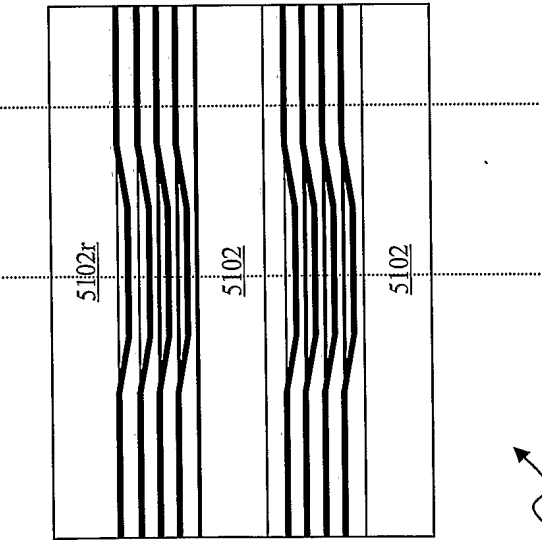


FIGURE 51A

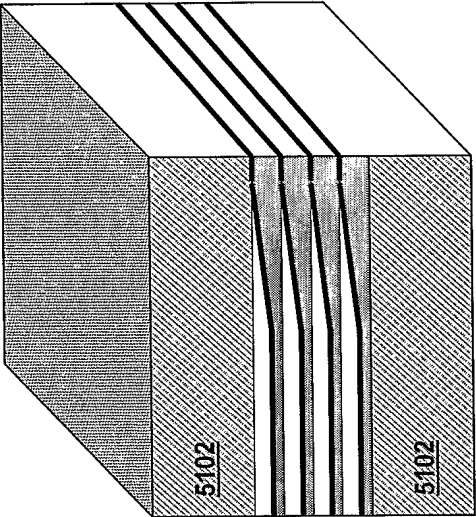


FIGURE 51B

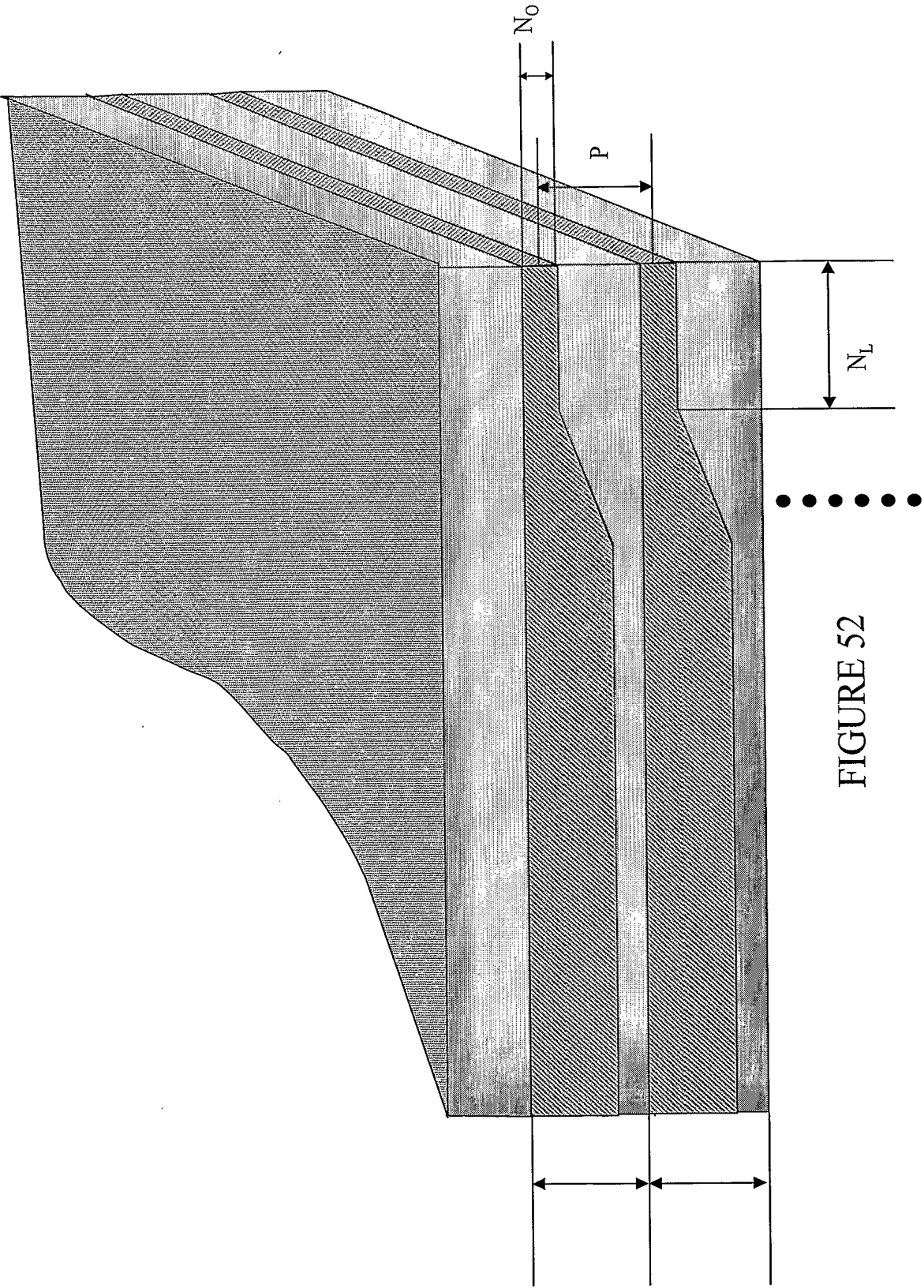


FIGURE 52

FIGURE 54B

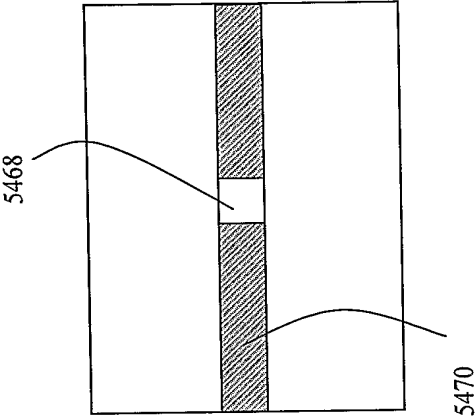


FIGURE 54A

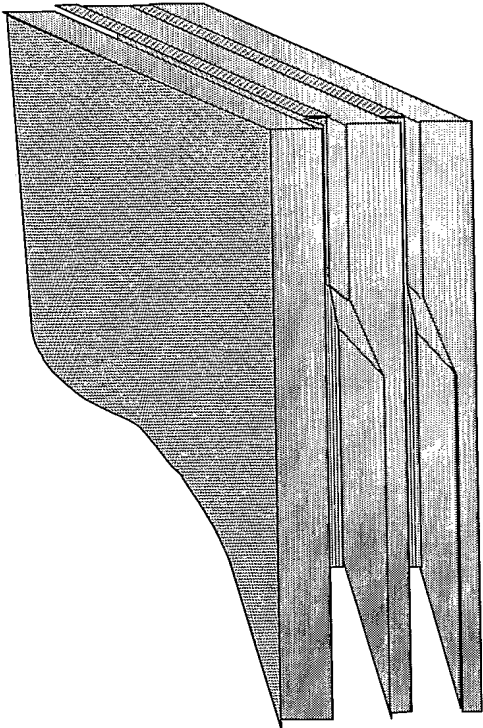
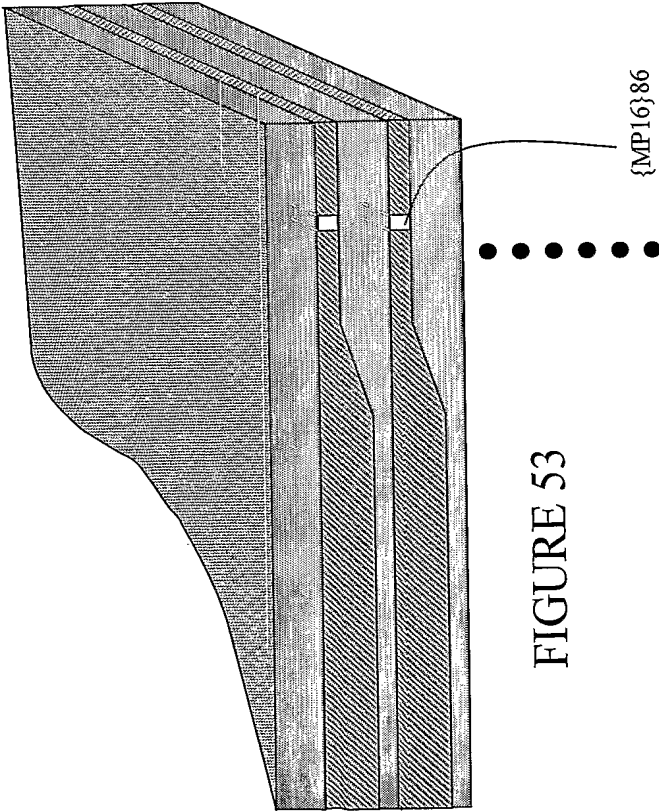
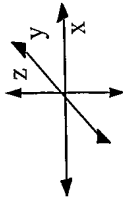
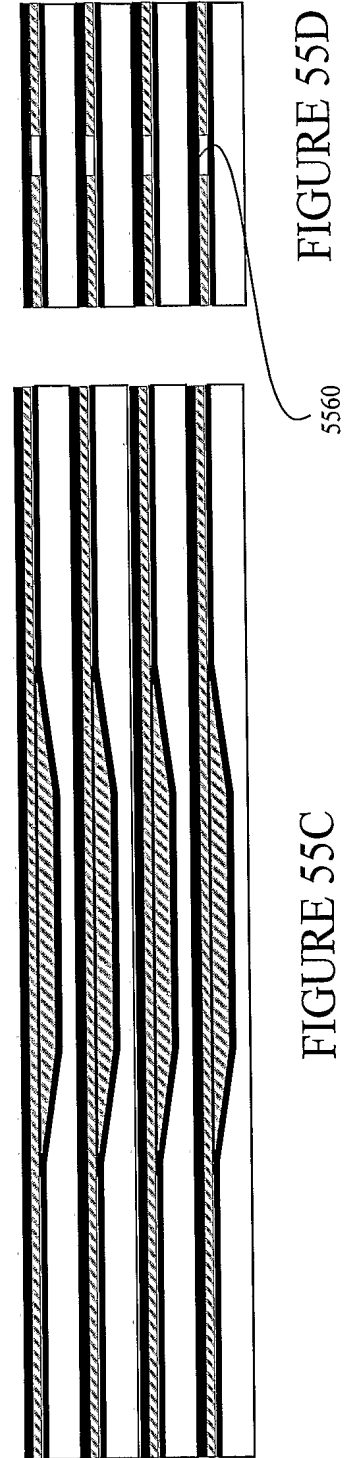
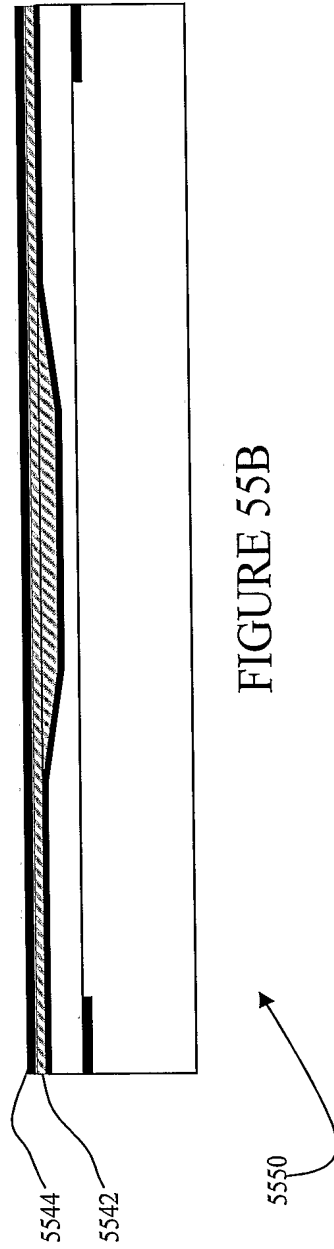
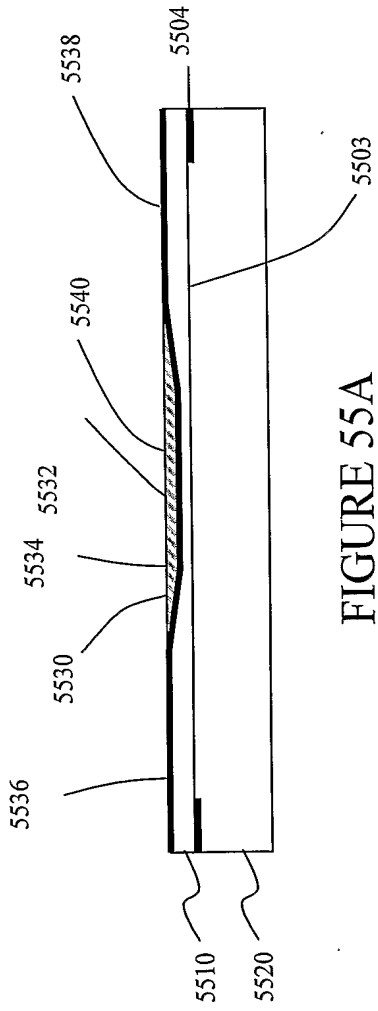


FIGURE 53





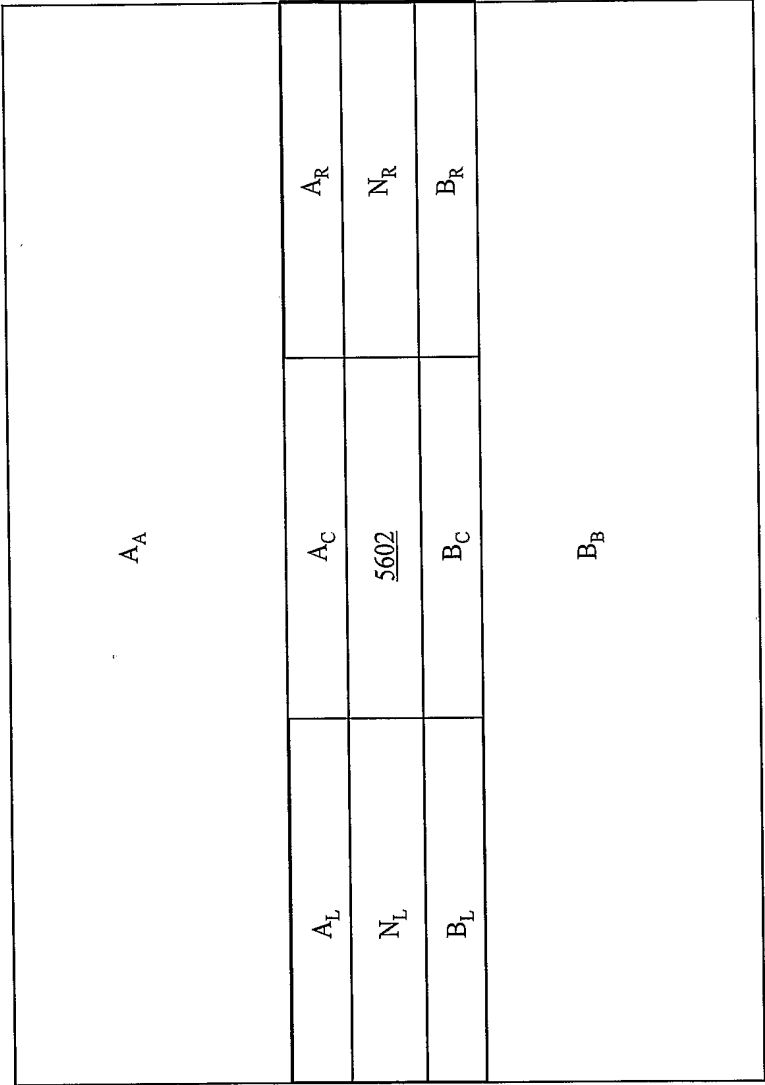


FIGURE 56

5600

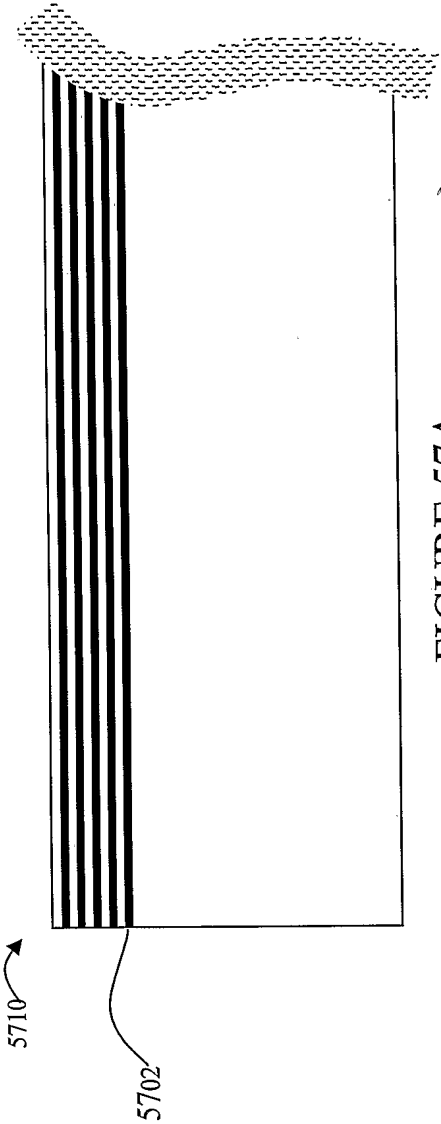


FIGURE 57A

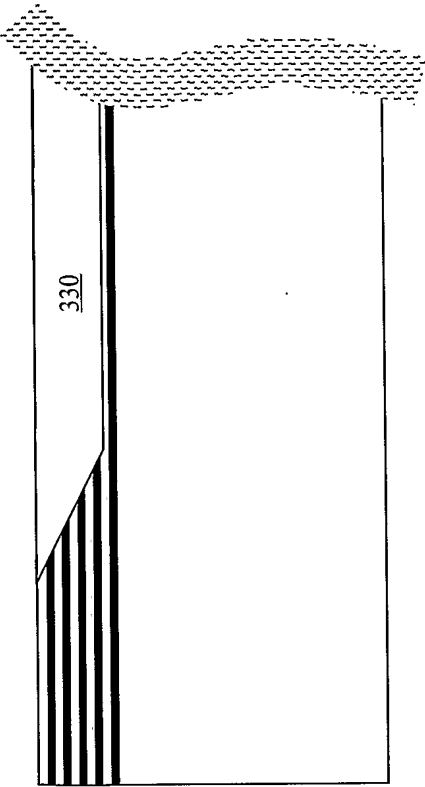


FIGURE 57B

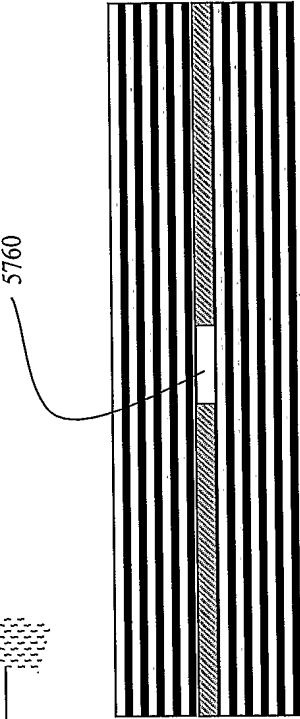
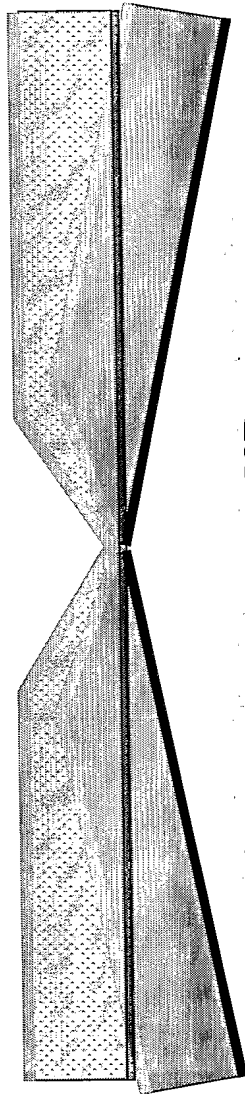
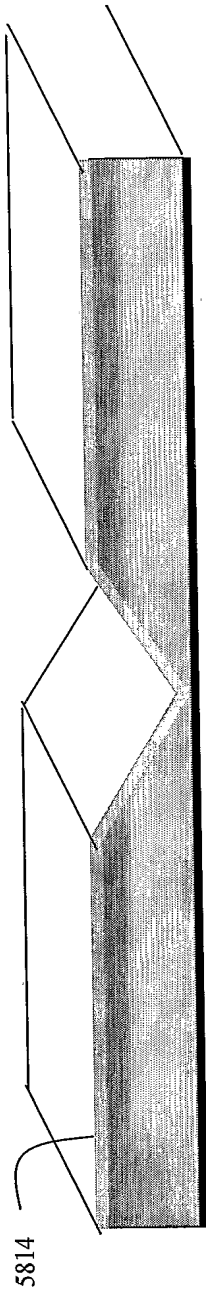
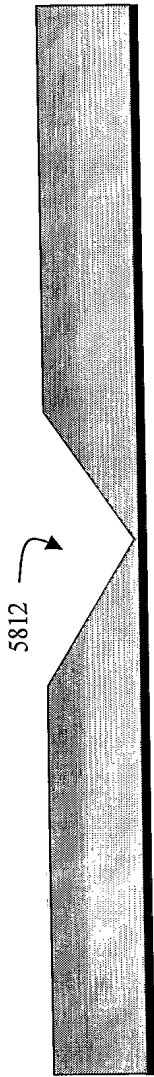
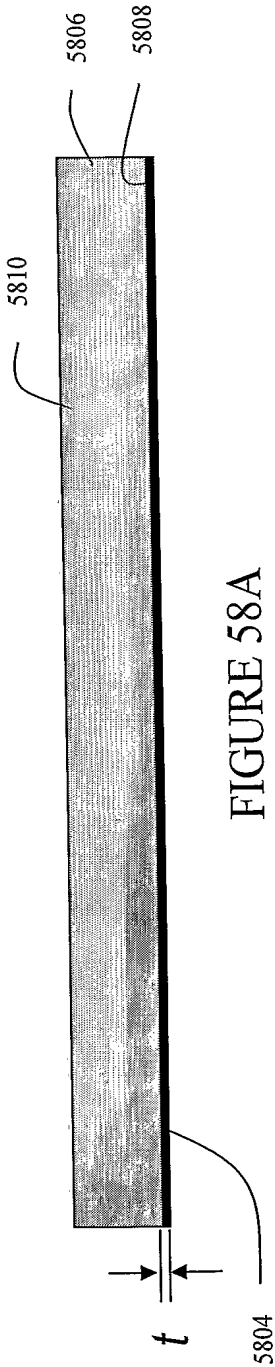


FIGURE 57C



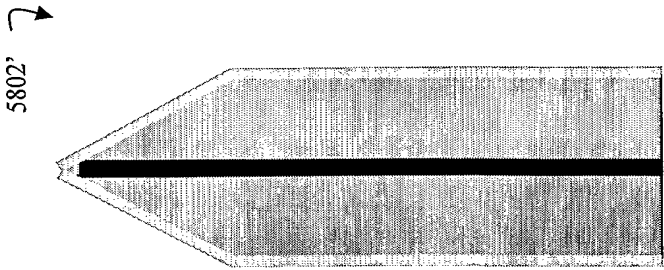


FIGURE 59A

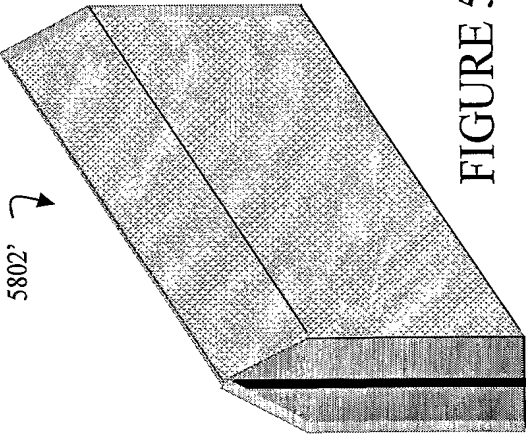


FIGURE 59B

5802

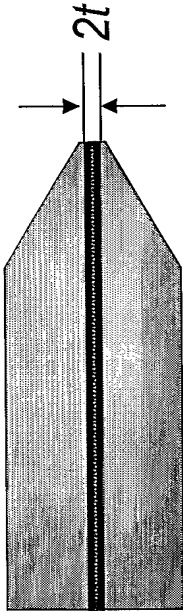
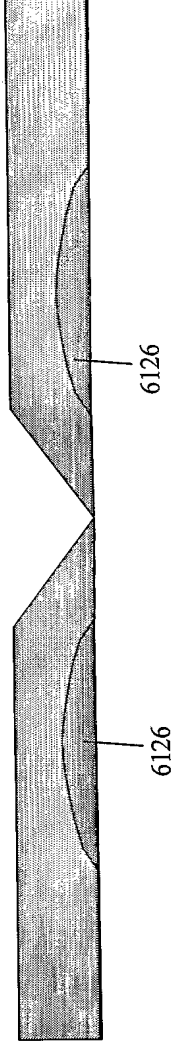
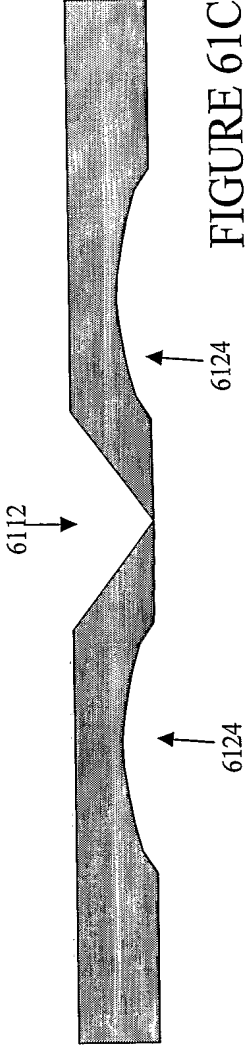
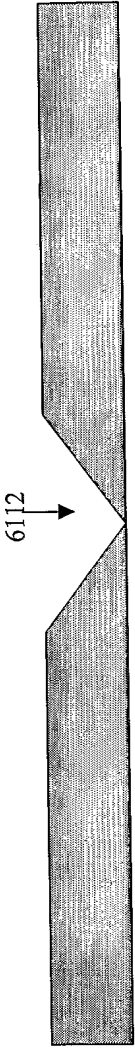
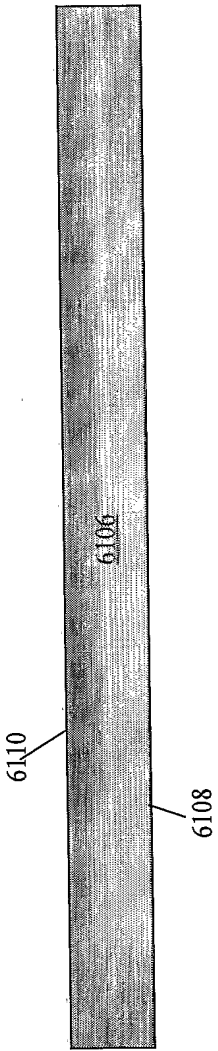


FIGURE 60



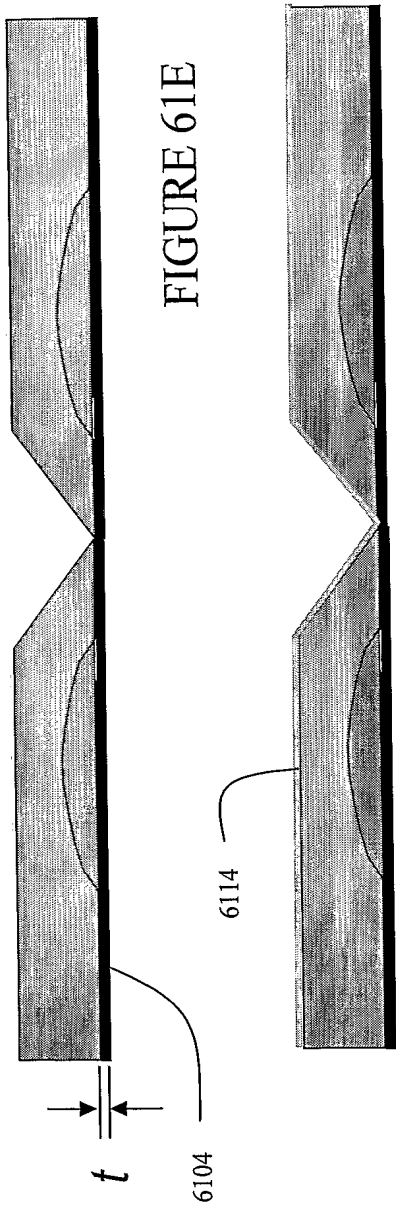


FIGURE 61F

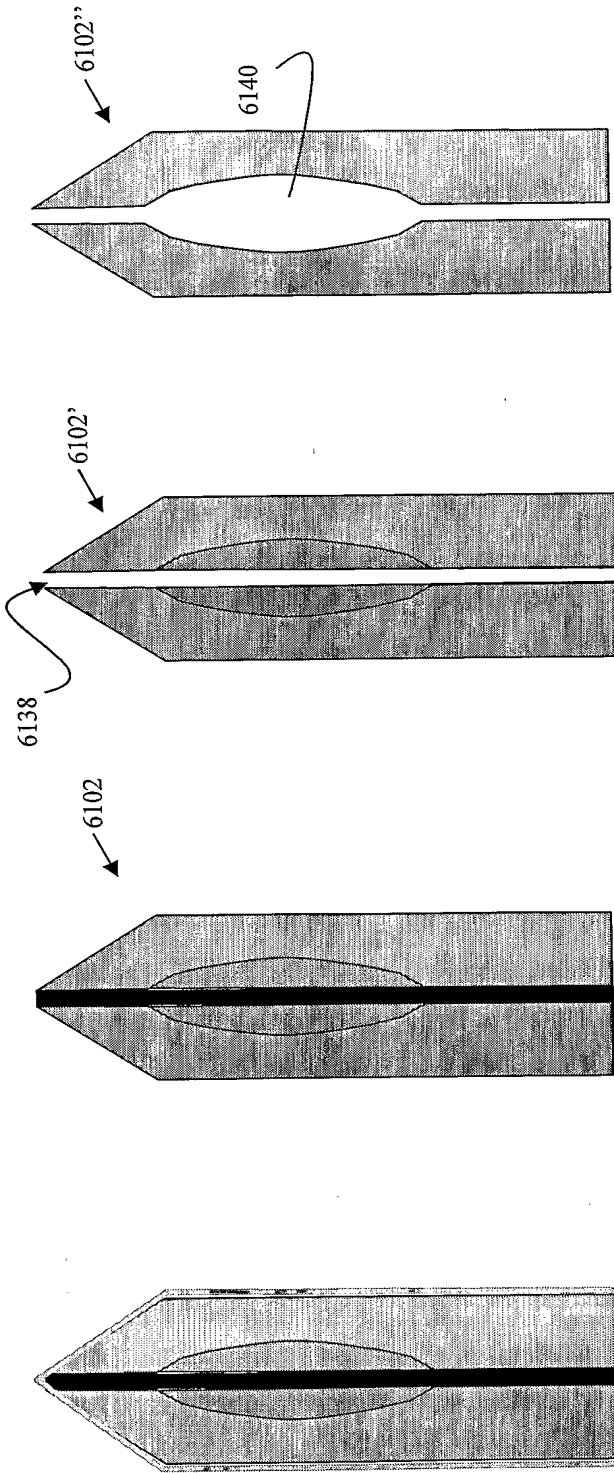


FIGURE 61H

FIGURE 61I

FIGURE 61J

FIGURE 61K

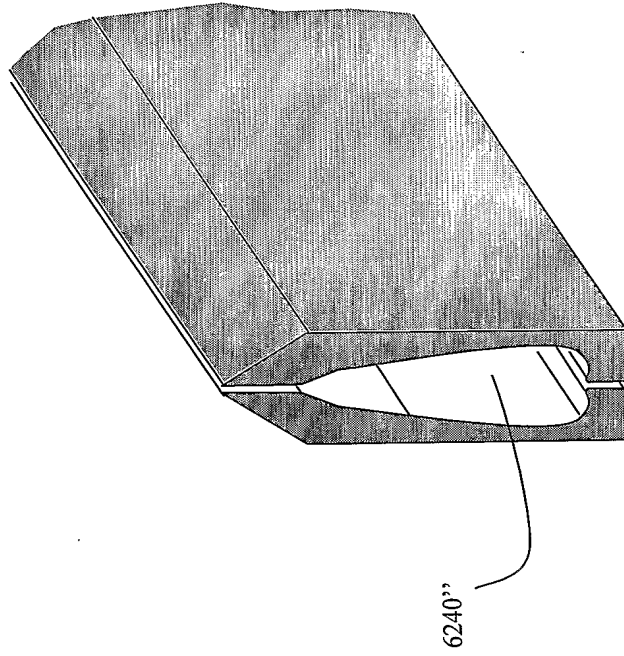


FIGURE 62B

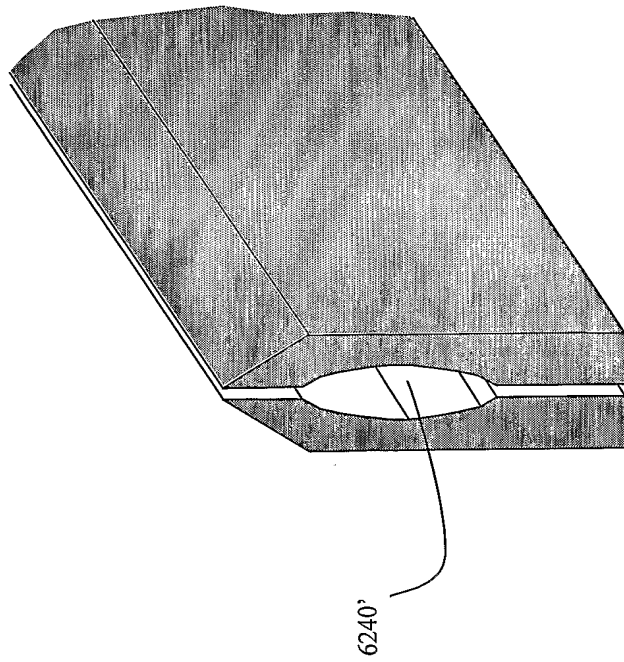
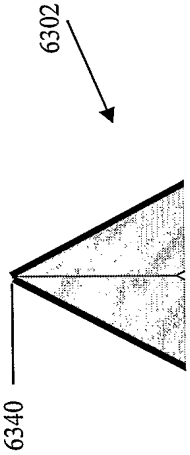
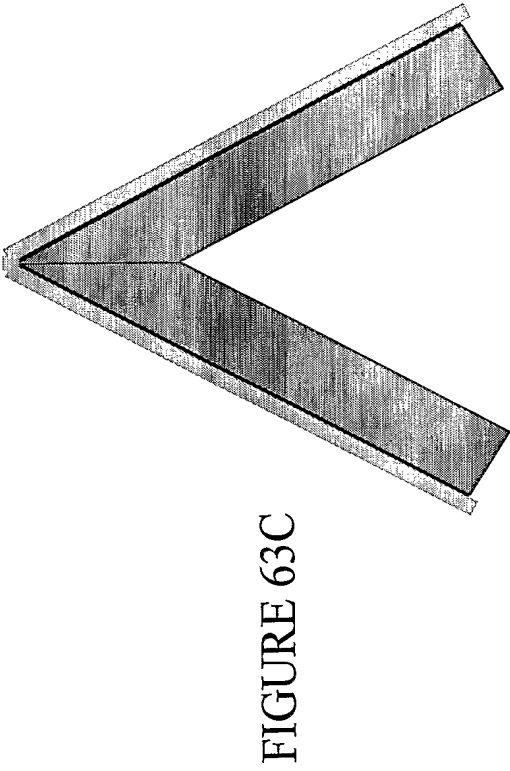
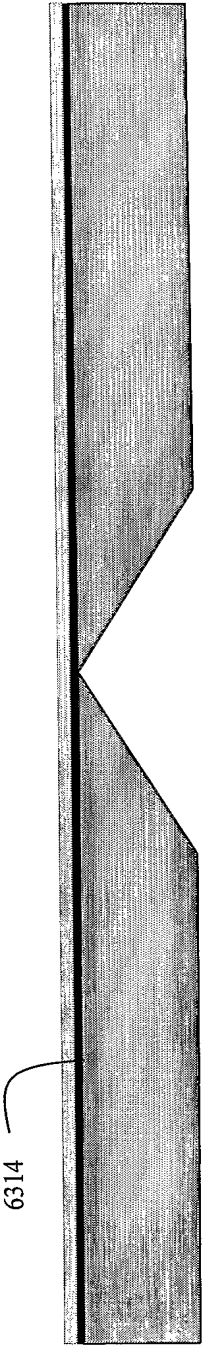
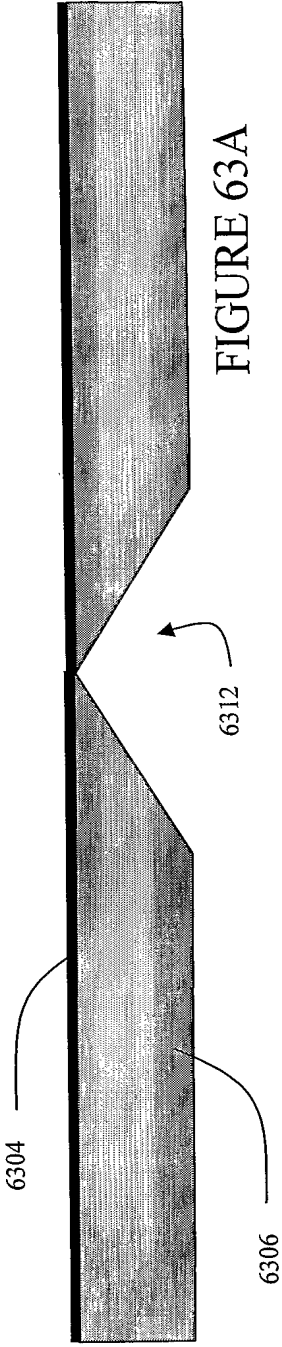
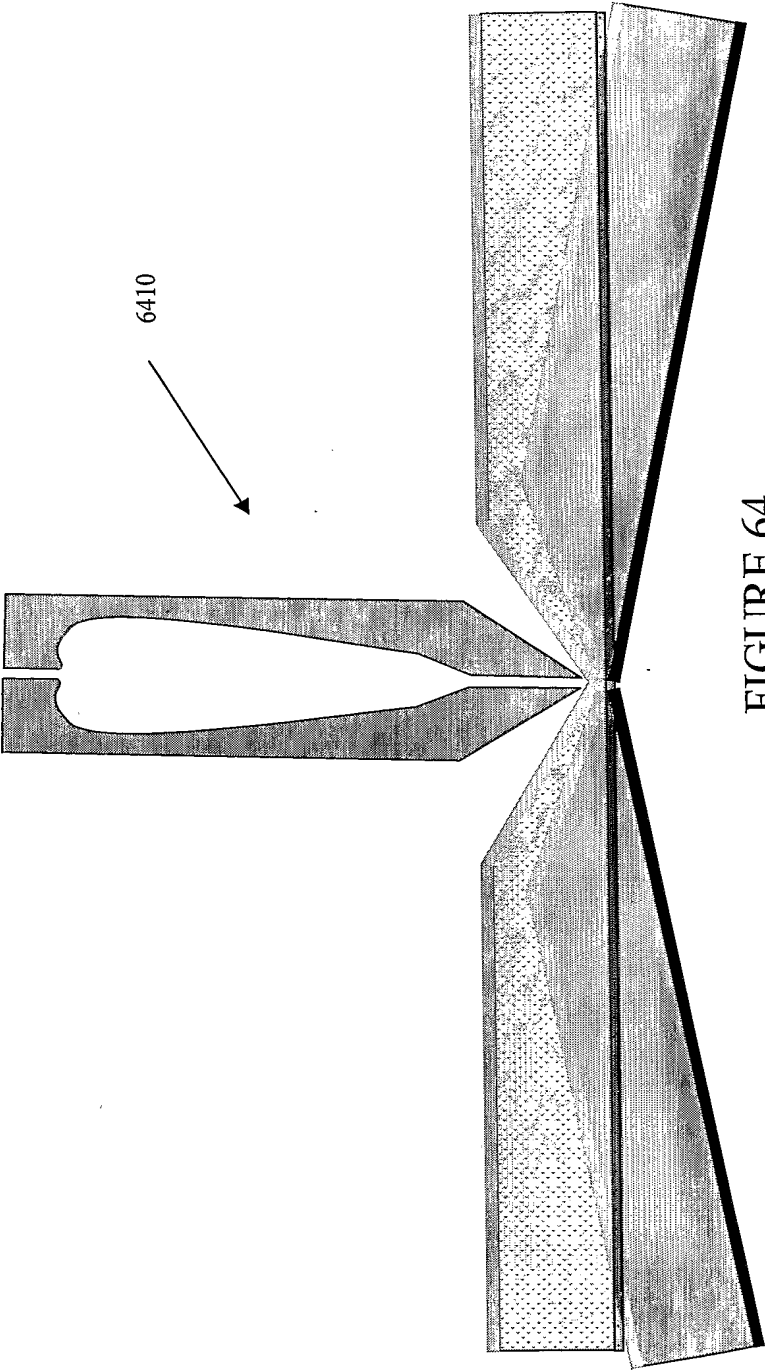


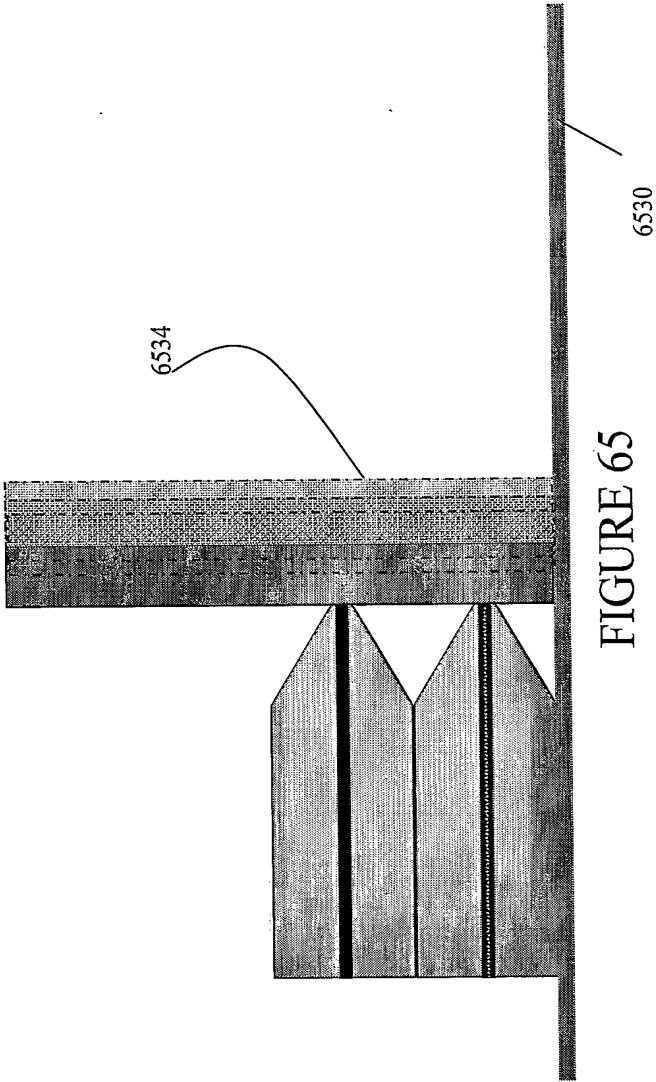
FIGURE 62A

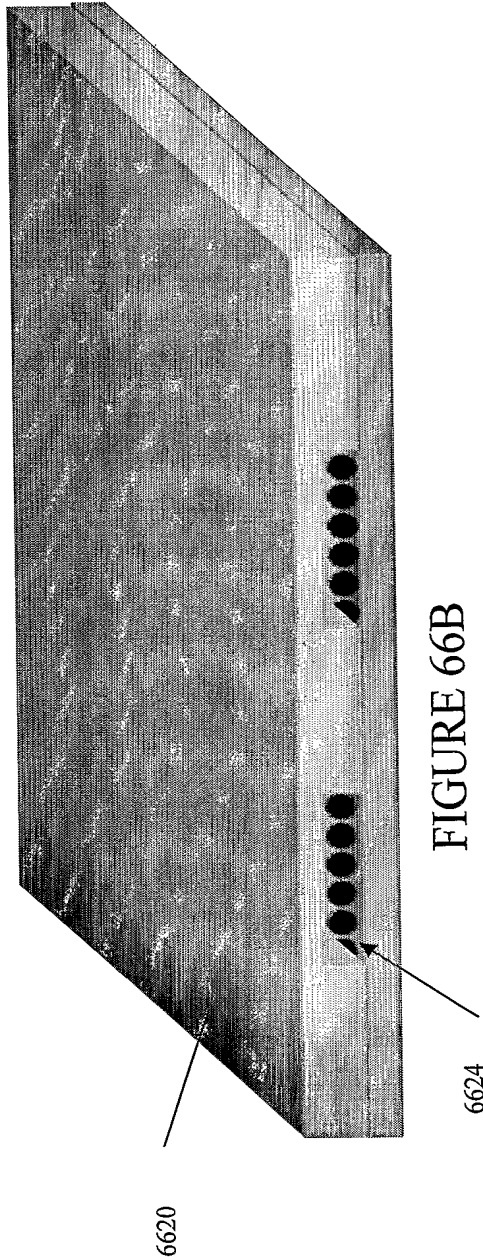
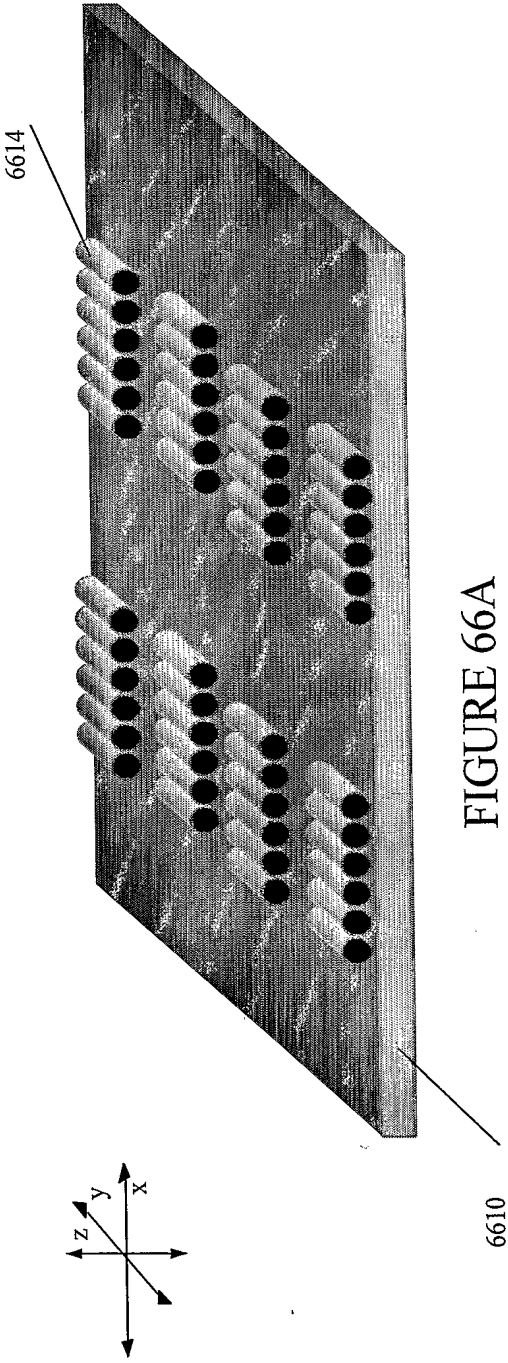




6410

FIGURE 64





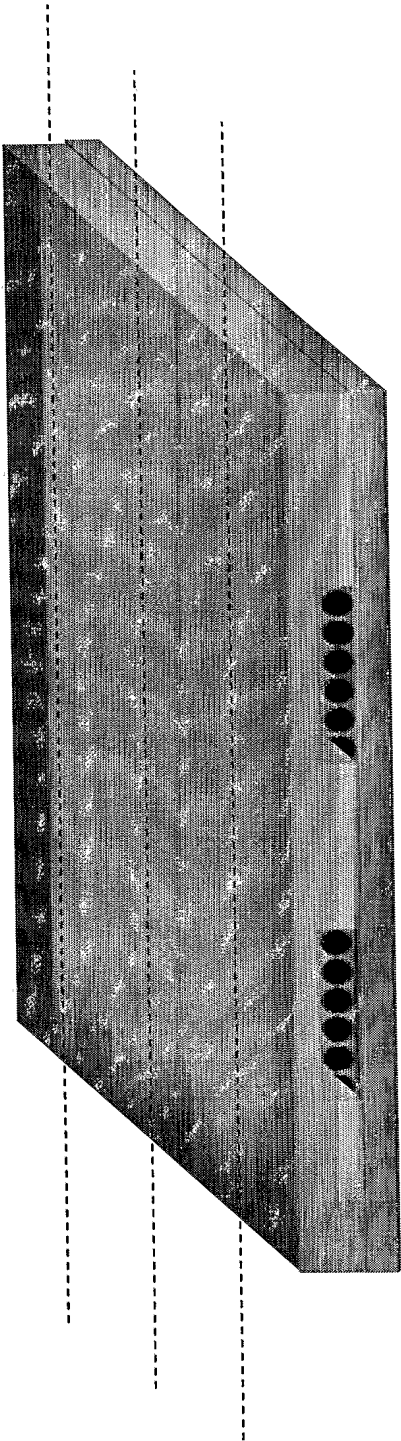


FIGURE 66C

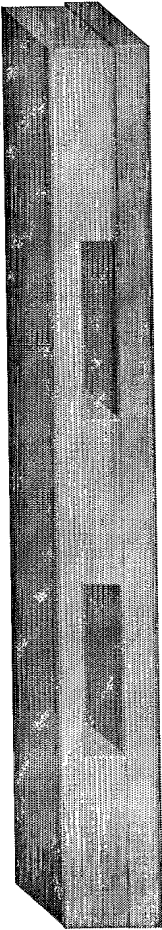
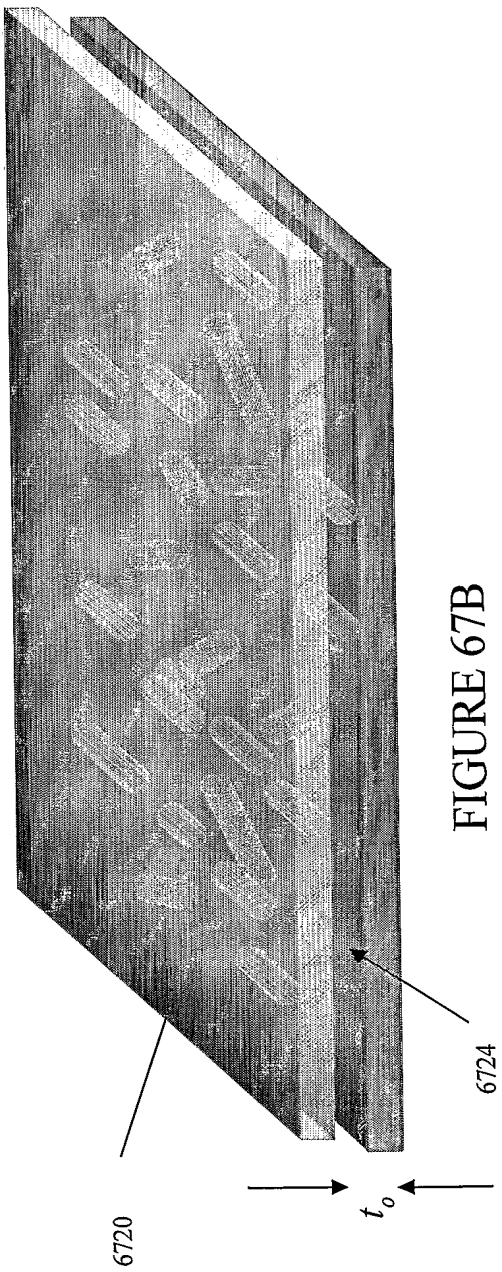
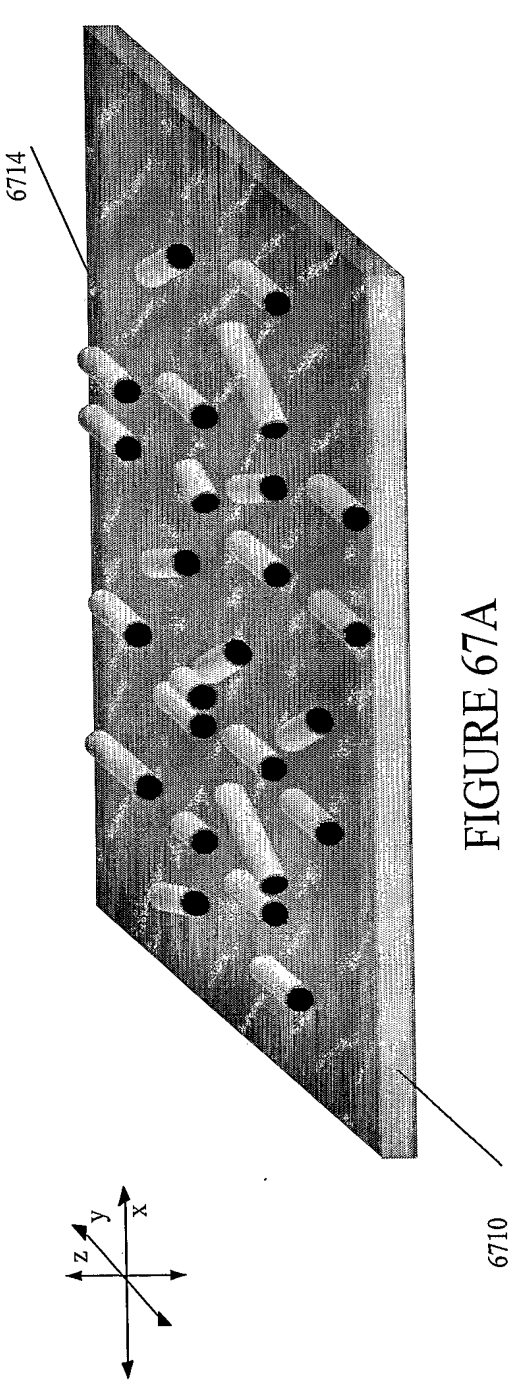


FIGURE 66D



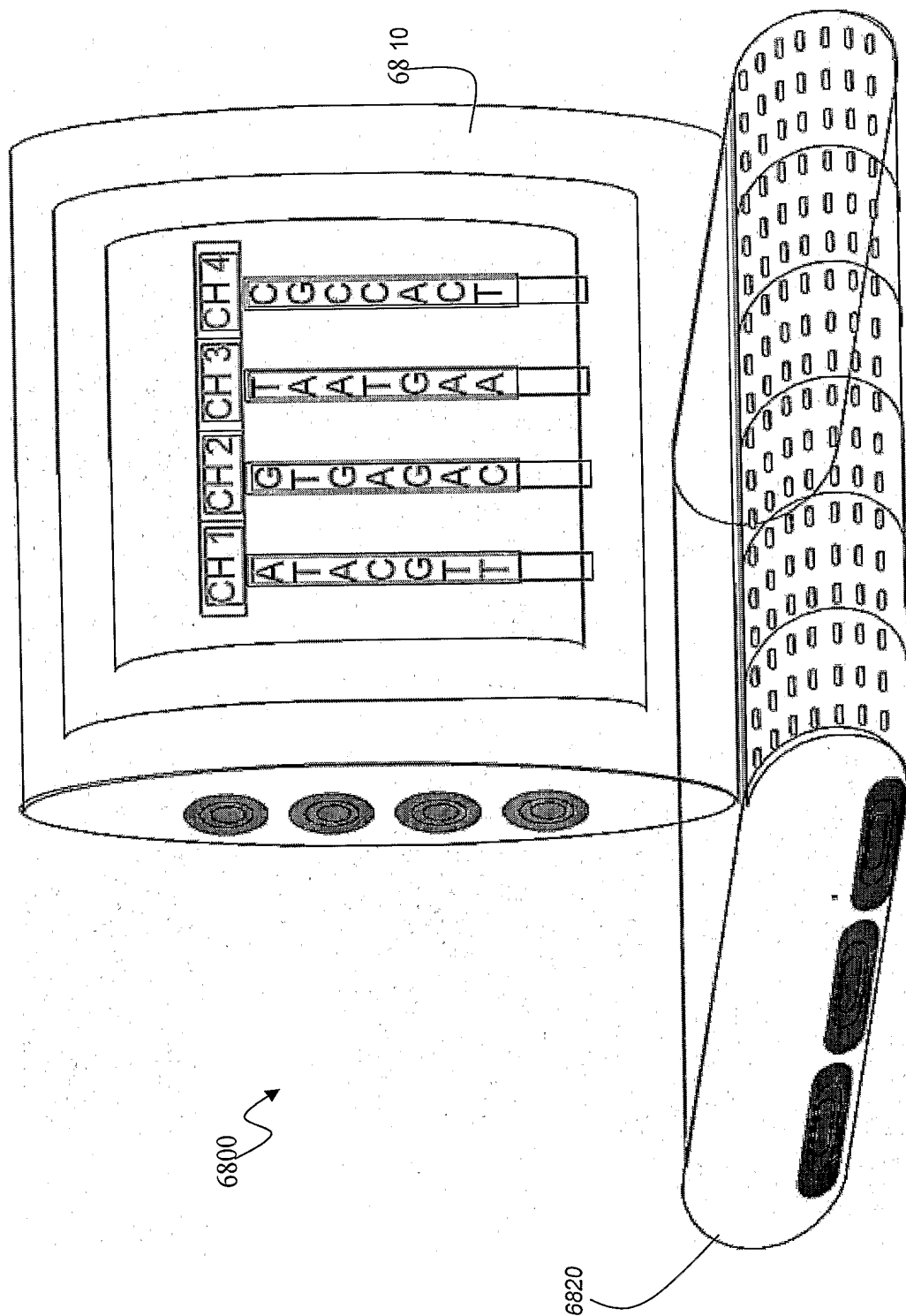


FIGURE 68

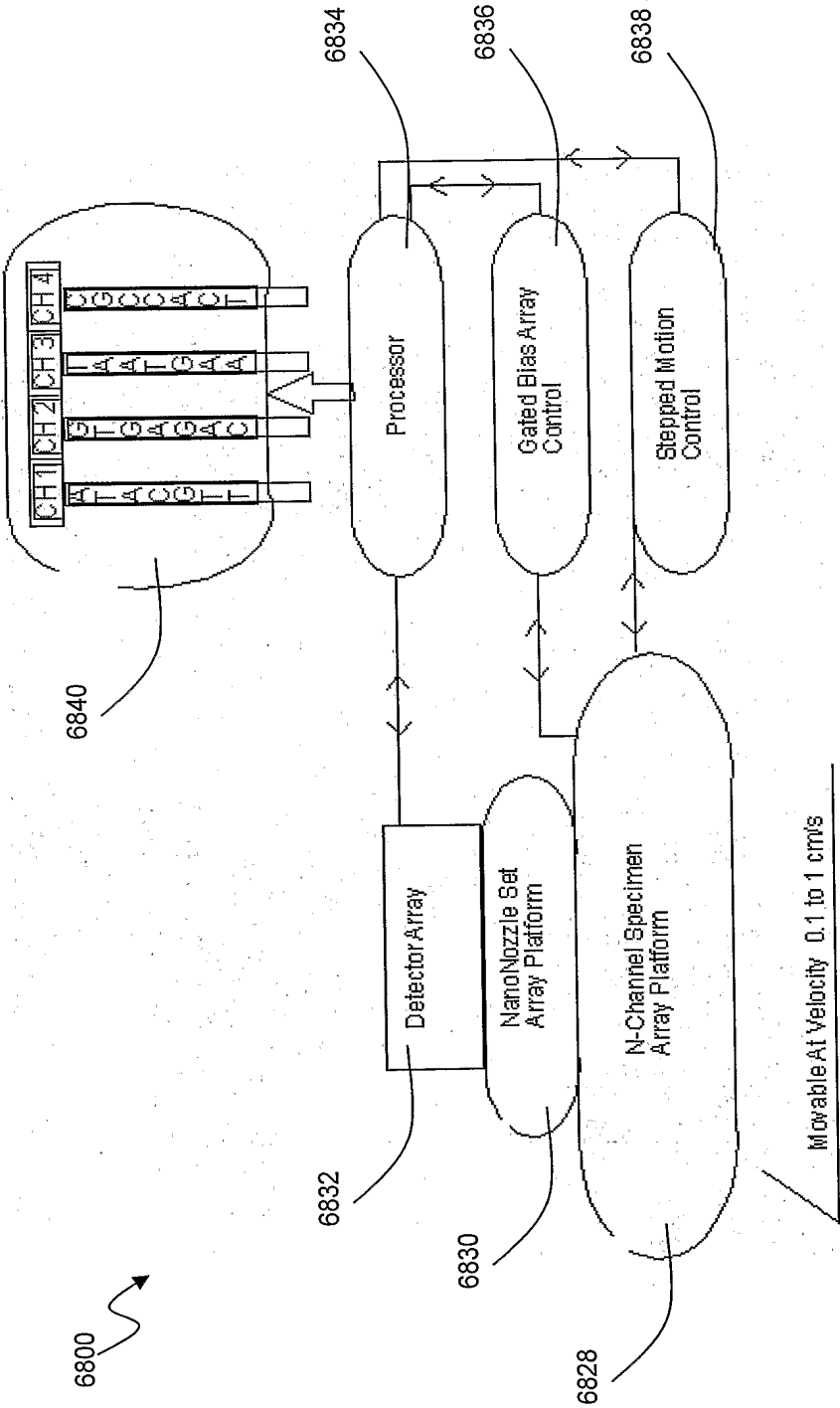


FIGURE 69

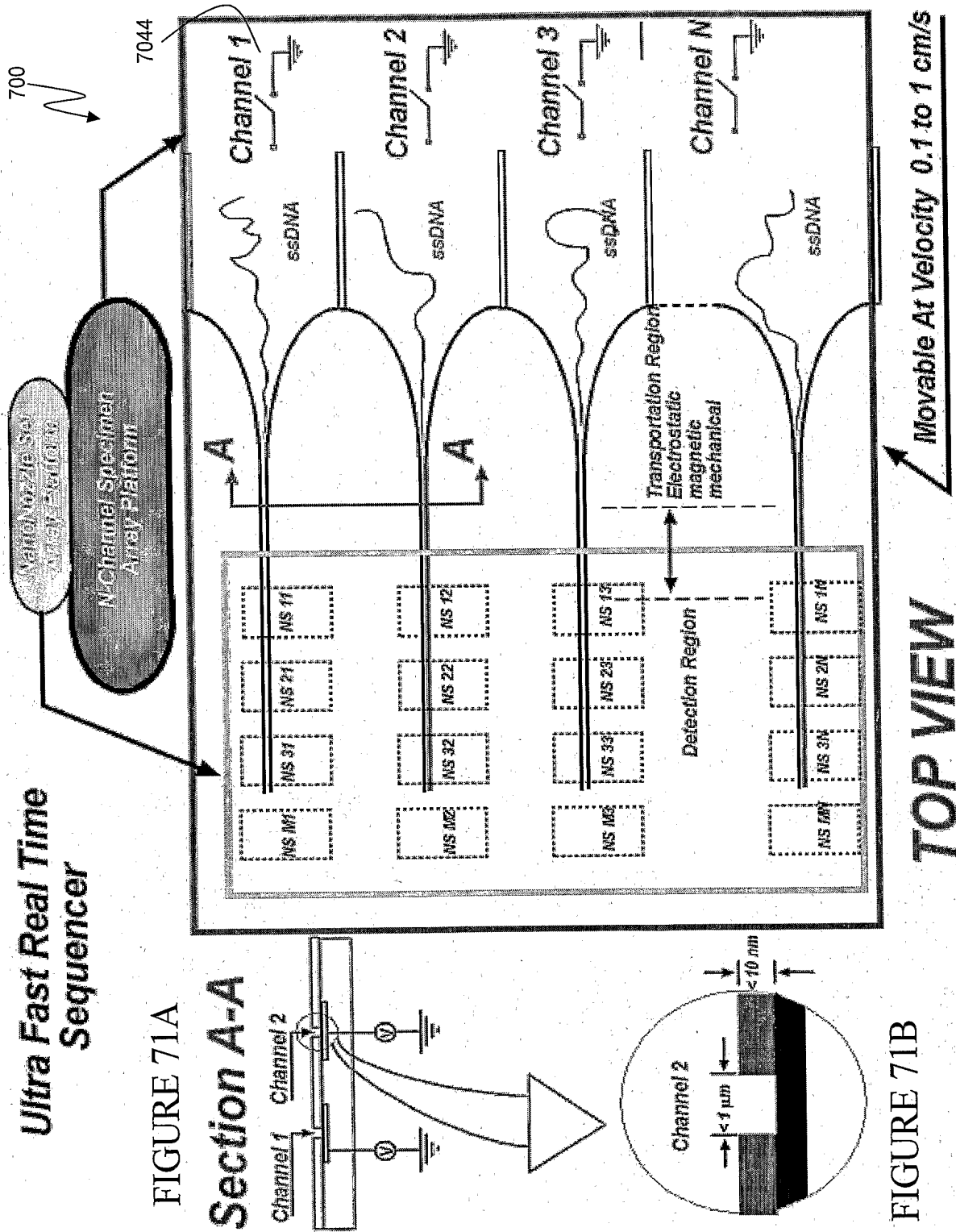


FIGURE 70

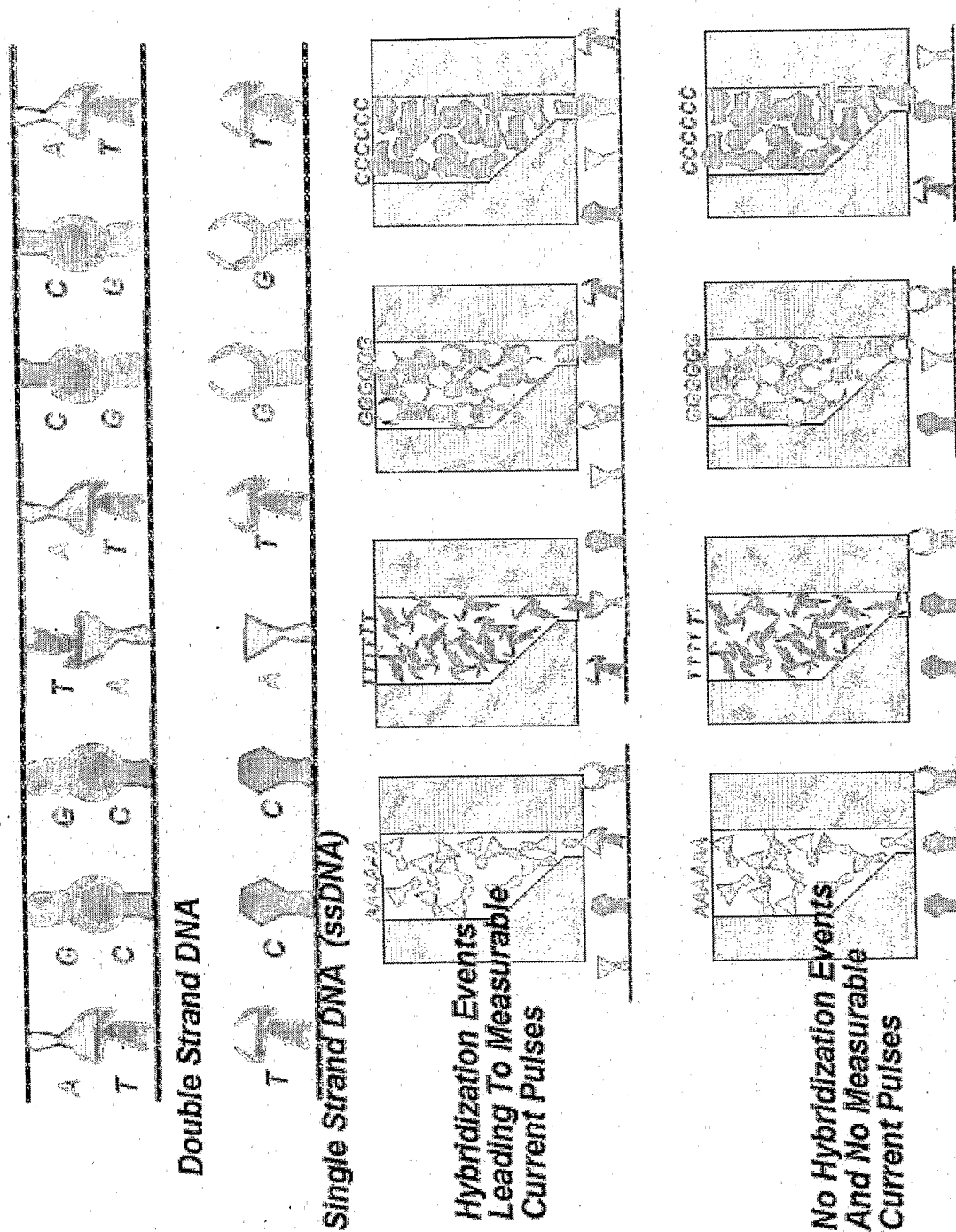


FIGURE 73

**All Possible 16 Combinations
Only 4 Produce Current Pulses
Upon A Hybridization Event**

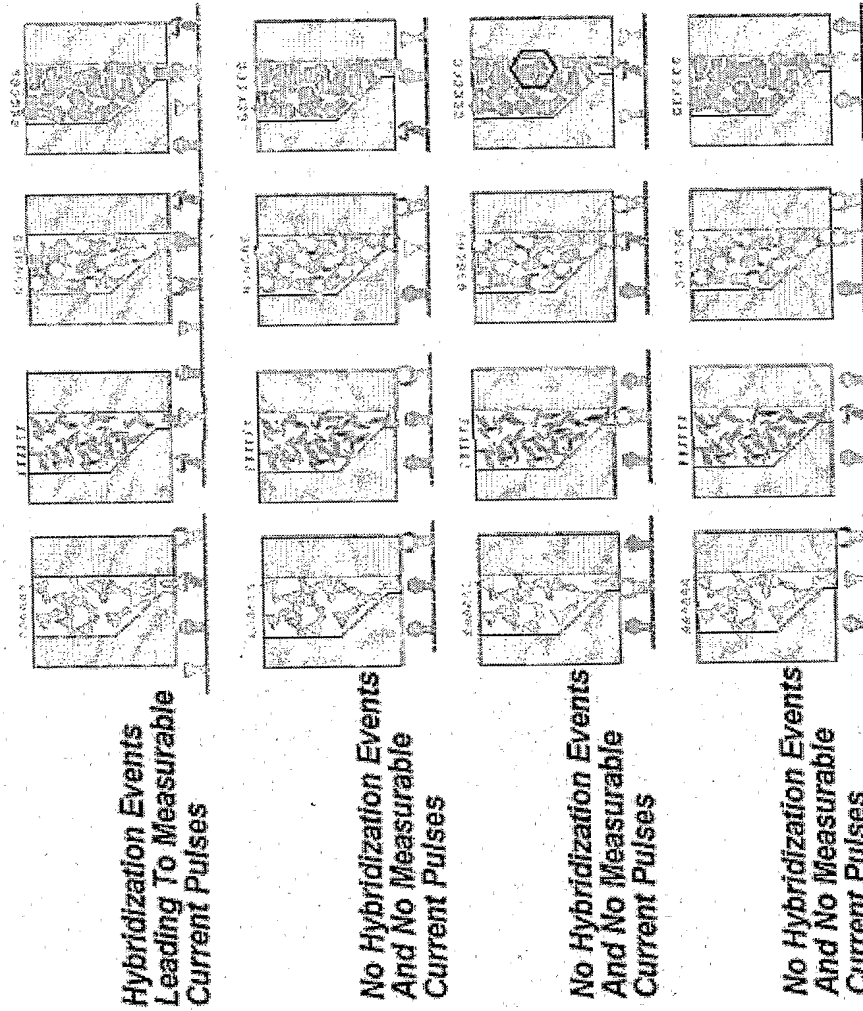


FIGURE 74

Reference Position And Precision nm Metrology

DNA base period $p_b = 0.5 \text{ nm}$

Nozzle opening $x_N = p_b = 0.5 \text{ nm}$

RPP size $< 0.5 \text{ nm}$

First Nozzle distance from RPP = 10 nm

Distance between Nozzles = 10 nm

Motion Step = 0.1 nm

$d_G = 10 \text{ nm} = 100 \text{ steps}$

$d_T = 20 \text{ nm} = 200 \text{ steps}$

$d_C = 30 \text{ nm} = 300 \text{ steps}$

$d_A = 40 \text{ nm} = 400 \text{ steps}$

Channel Depth = $< 10 \text{ nm}$

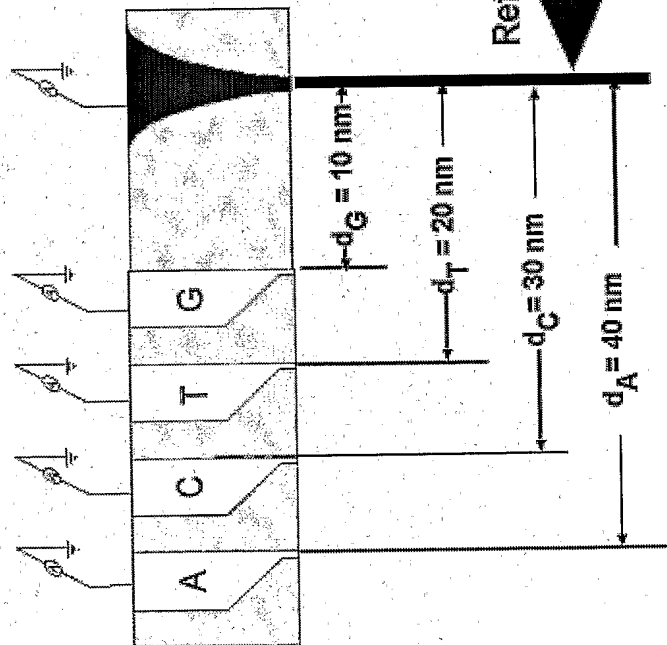


FIGURE 75

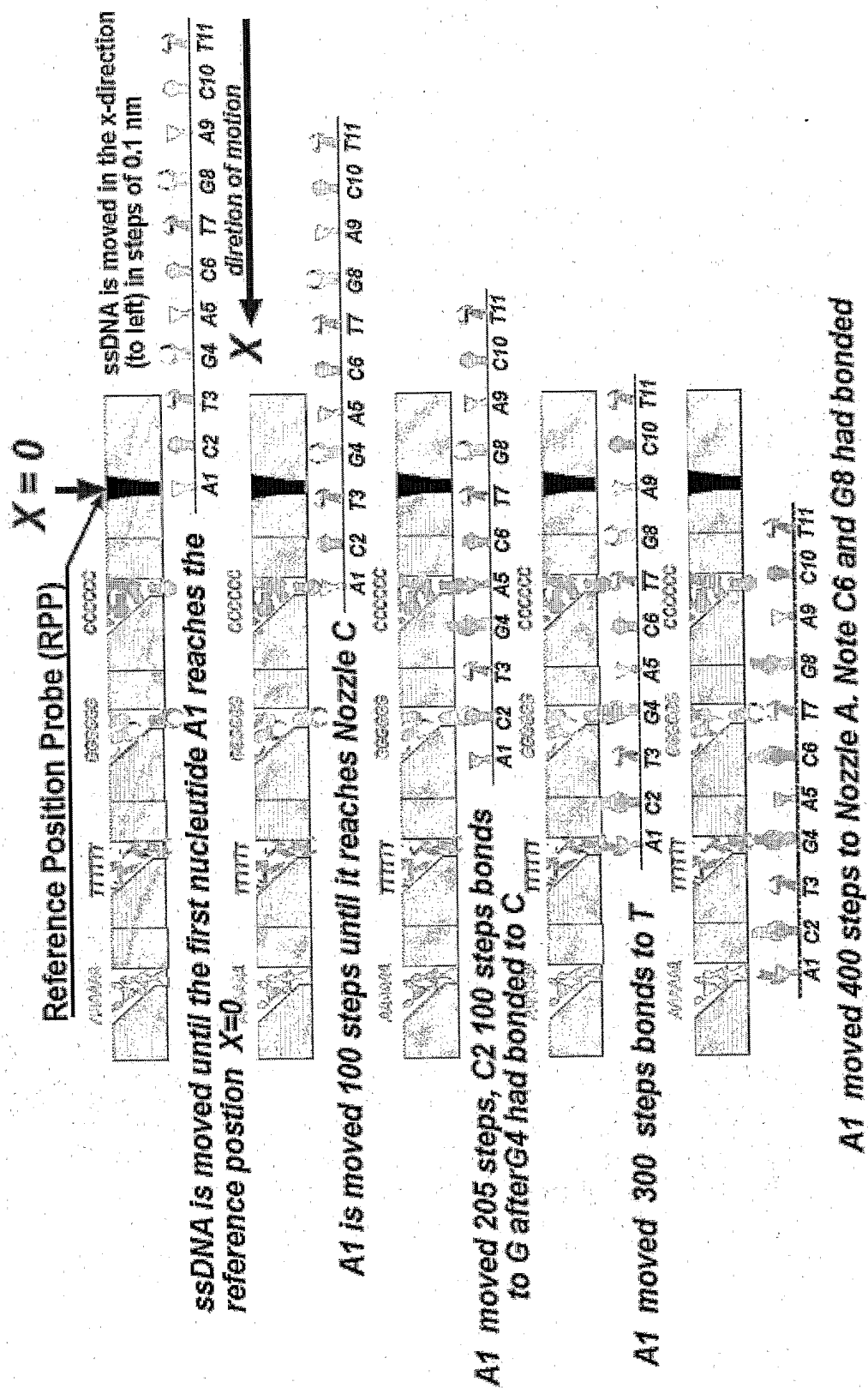


FIGURE 76

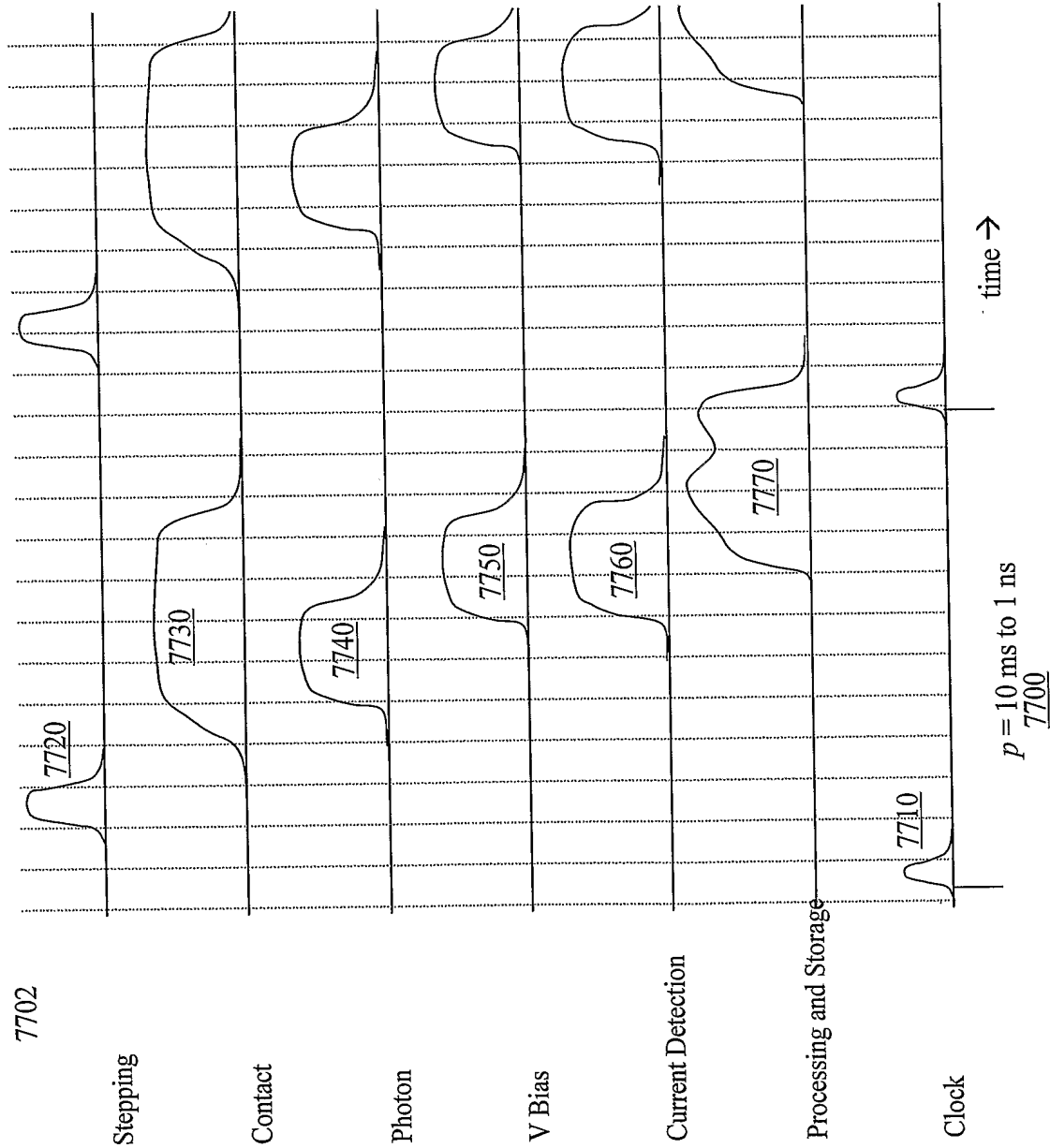
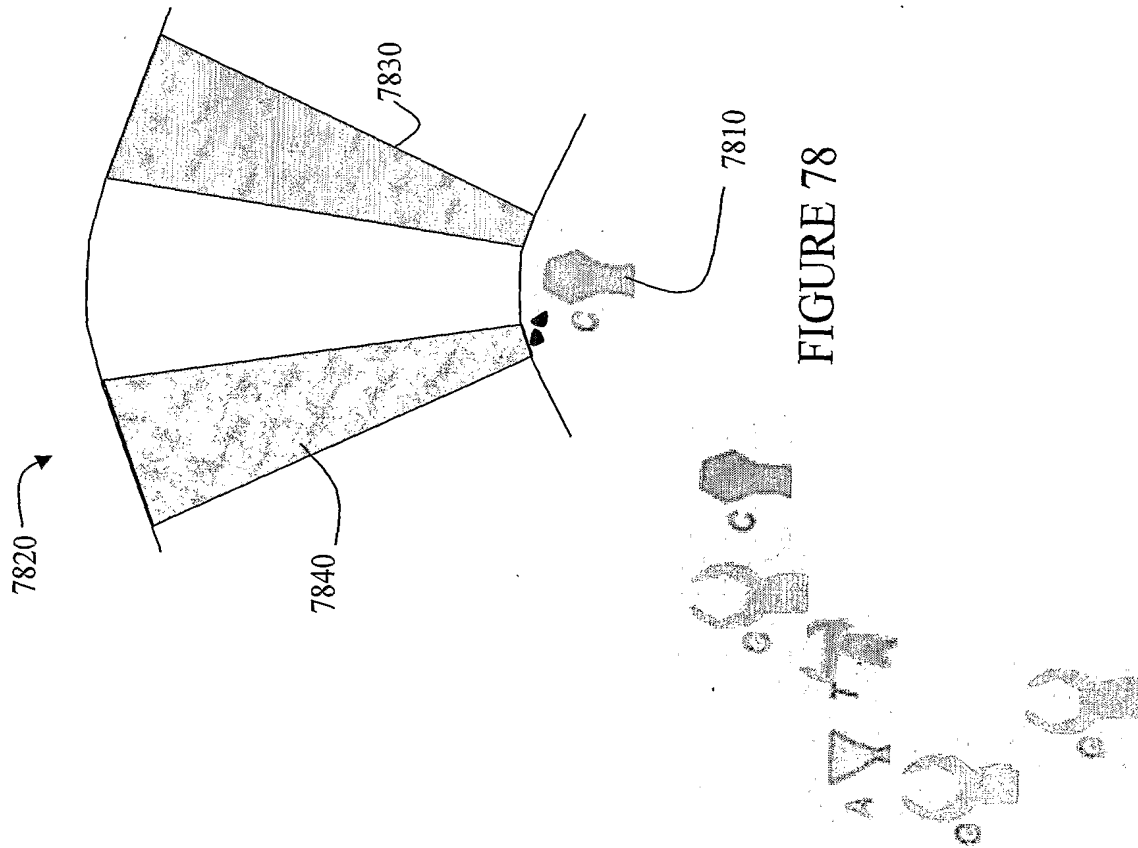


FIGURE 77



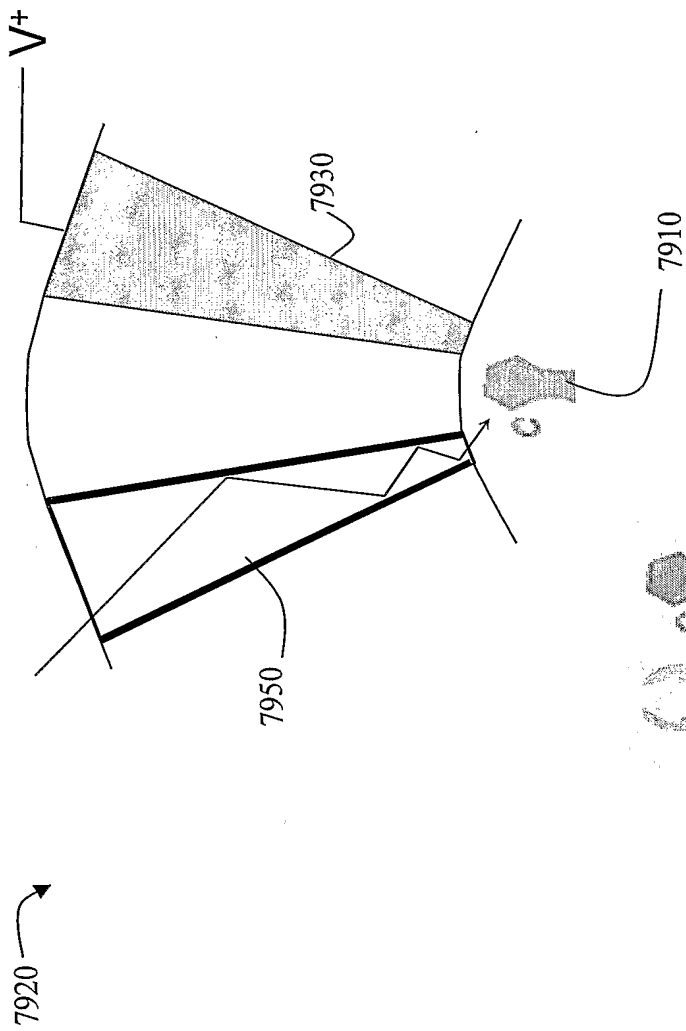
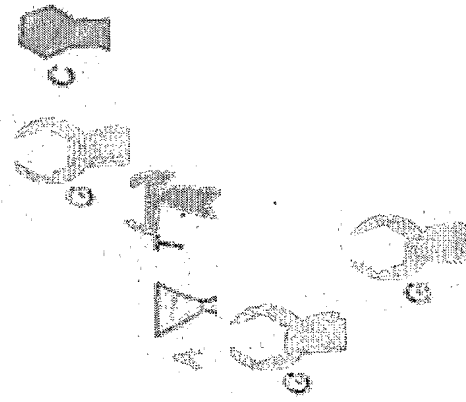
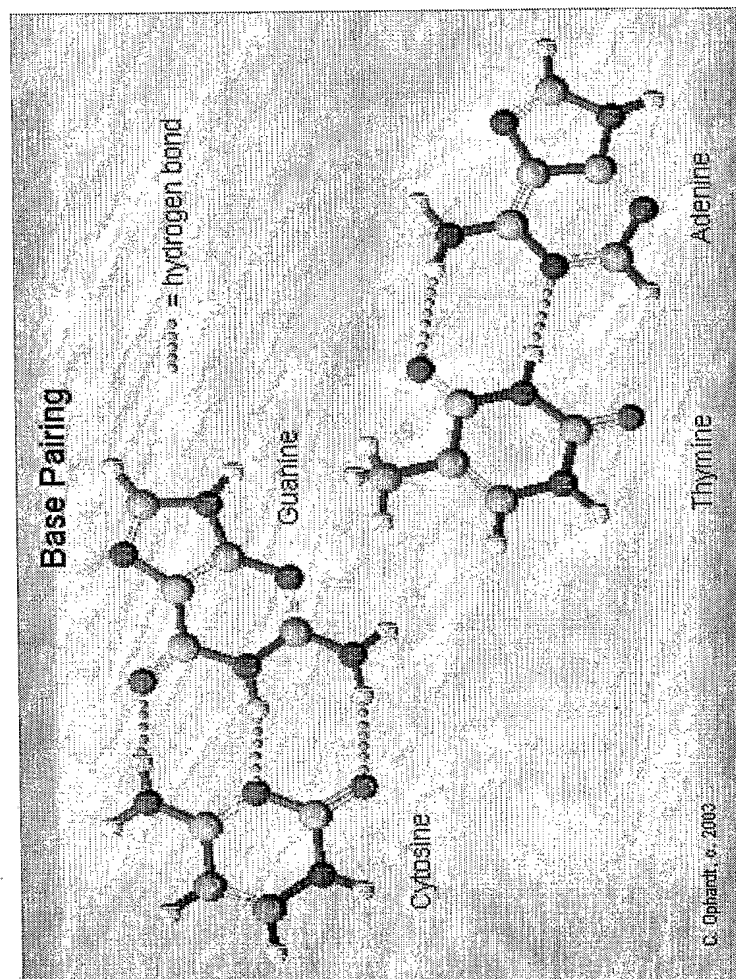


FIGURE 79





<http://www.elmhurst.edu/~chm/vchembook/582dnaDOUBLEhelix.html>

FIGURE 80

Quantum Tunneling

$$I \sim \exp(-As)$$

$$A = f(V, t, \omega, \dots)$$

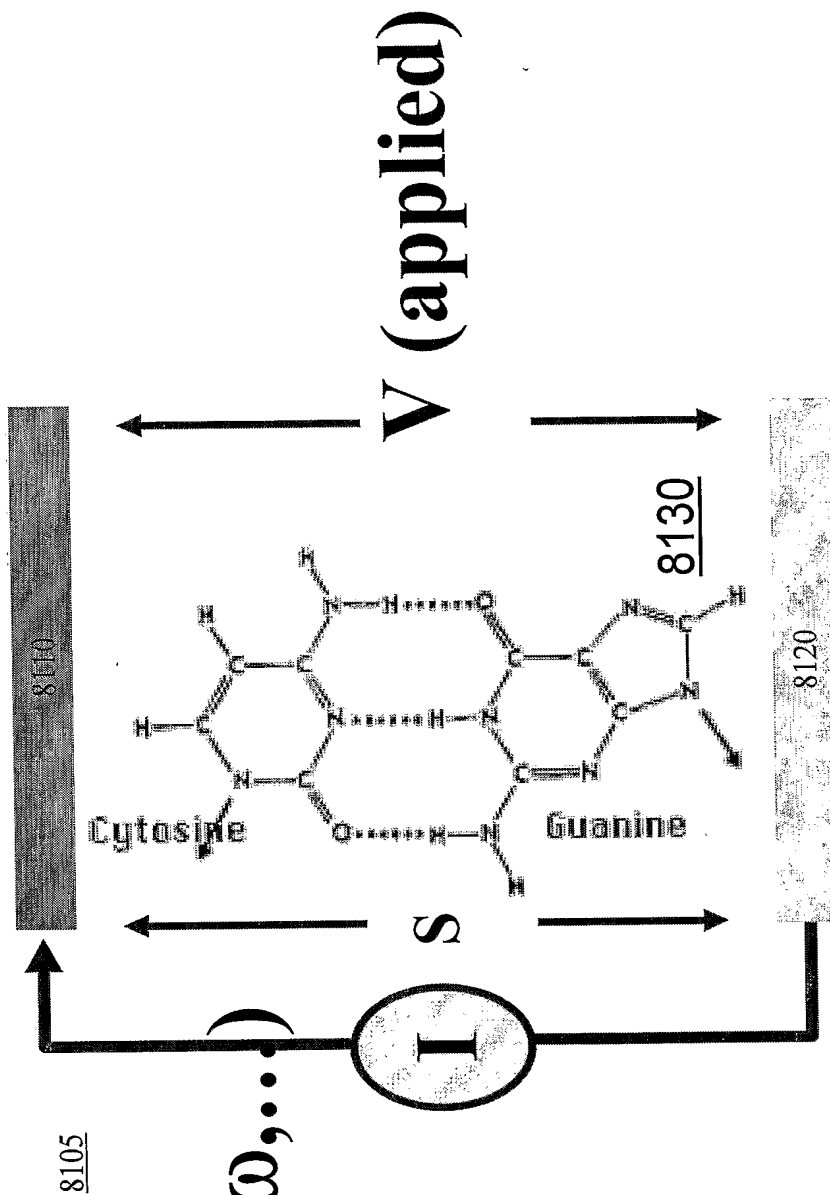


FIGURE 81

Elastic Tunneling

$$I \sim \exp(-As)$$

$$A = f(V, t, \omega, \dots)$$

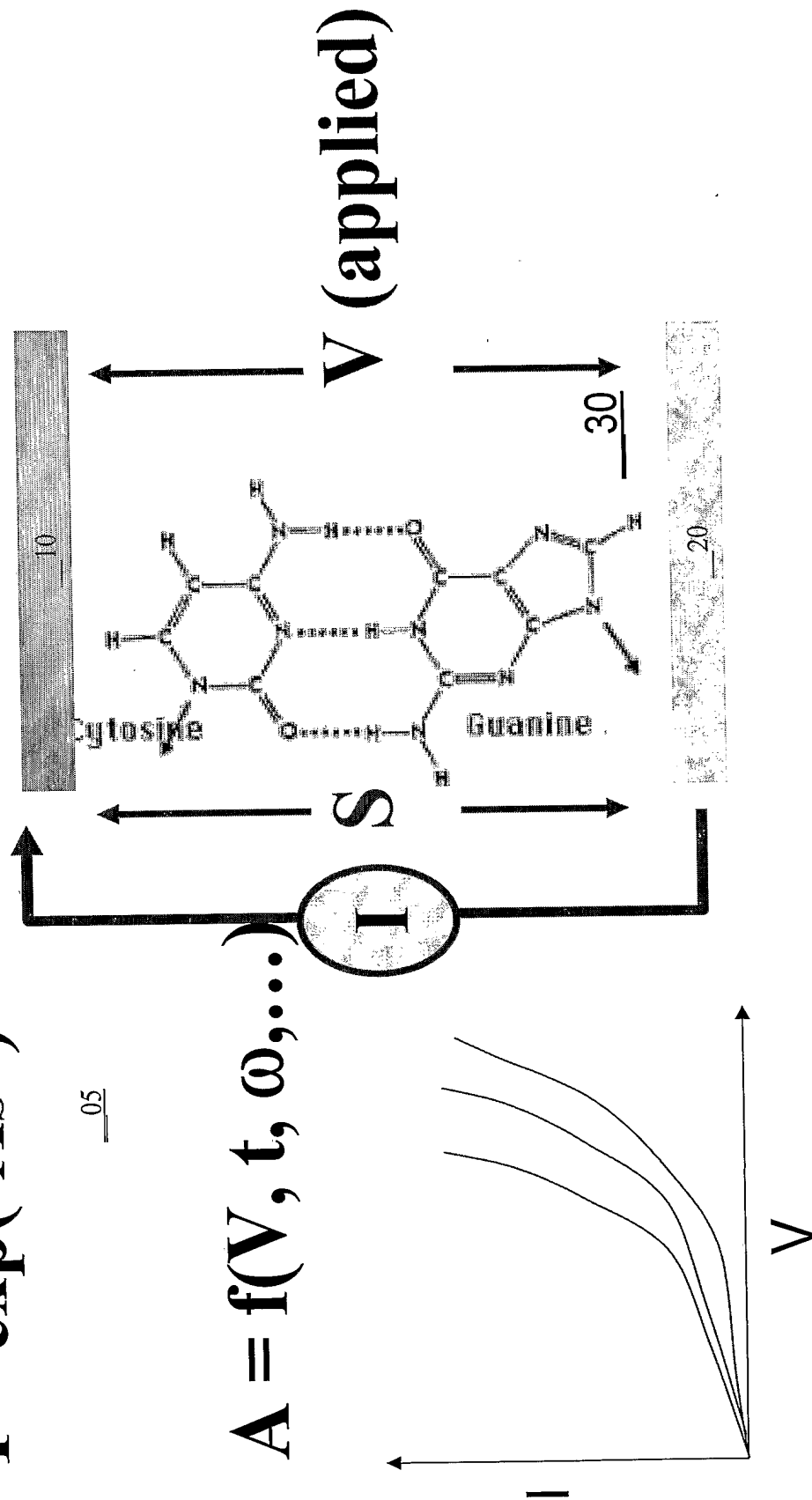
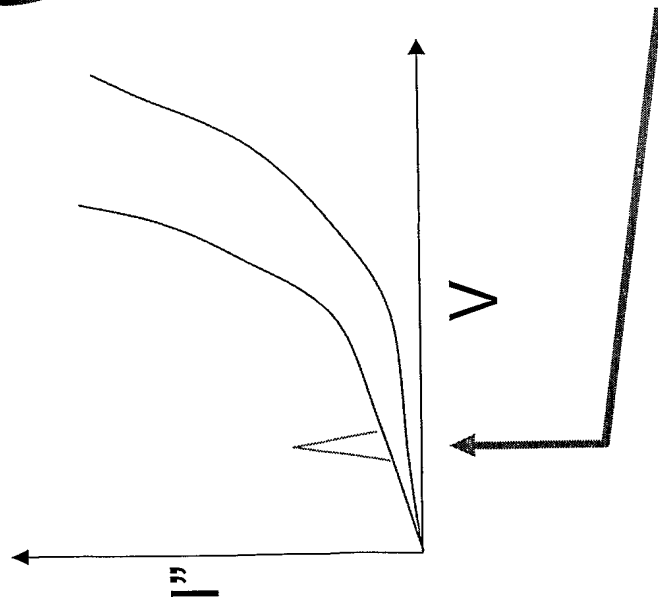
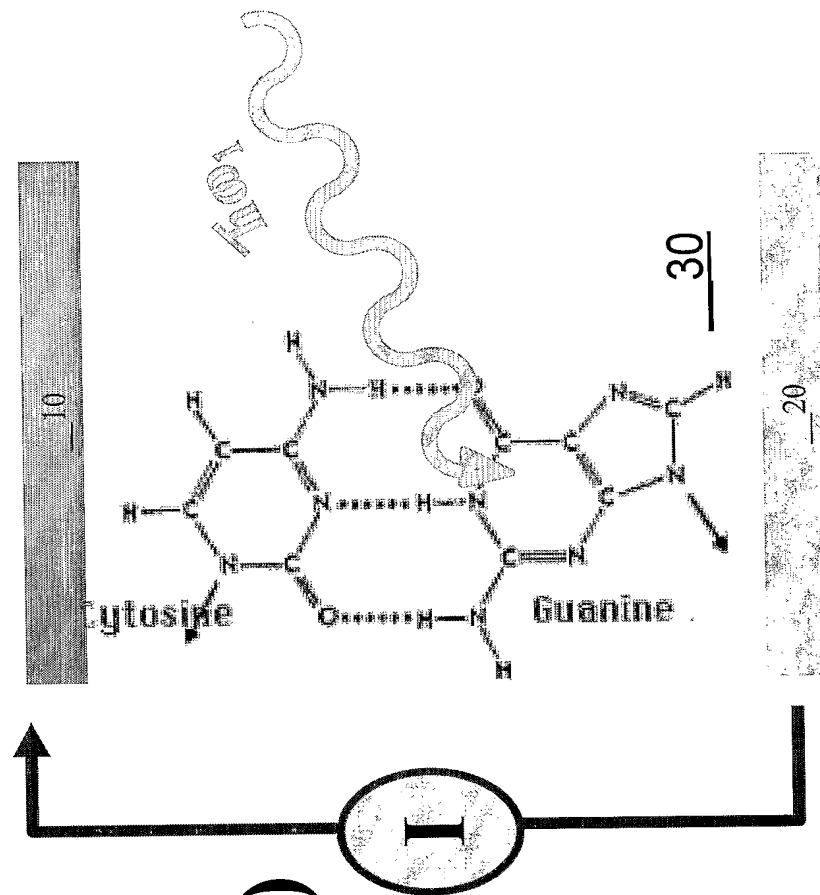


FIGURE 82

Inelastic Tunneling

$$I \sim \exp(-As) \quad \underline{05}$$

$$A = f(V, t, \omega, \dots)$$



$$eV = \hbar\omega$$

FIGURE 83

$$E_{qc} = \frac{1}{2} (Cq V^2) / KT \gg 1$$

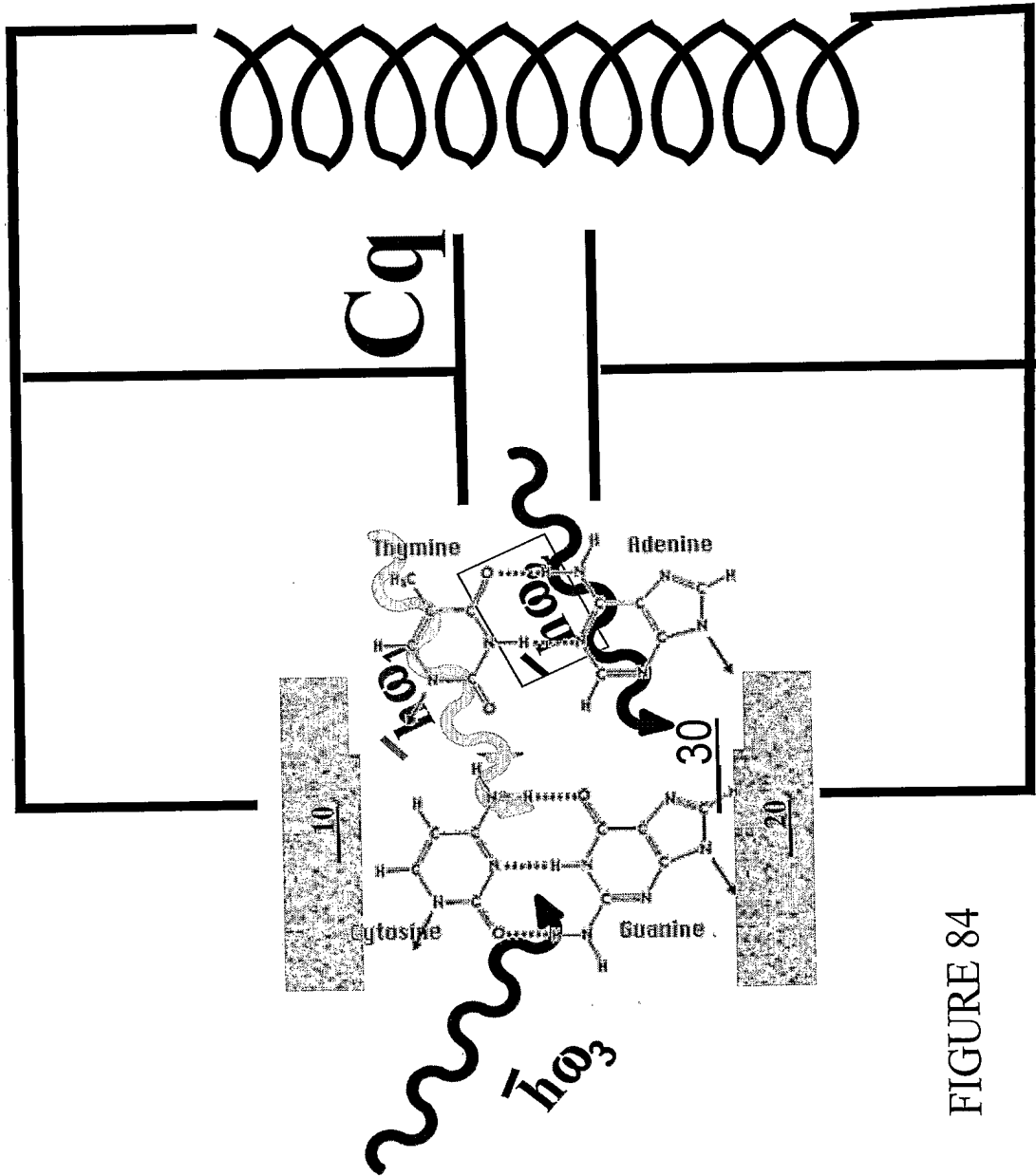
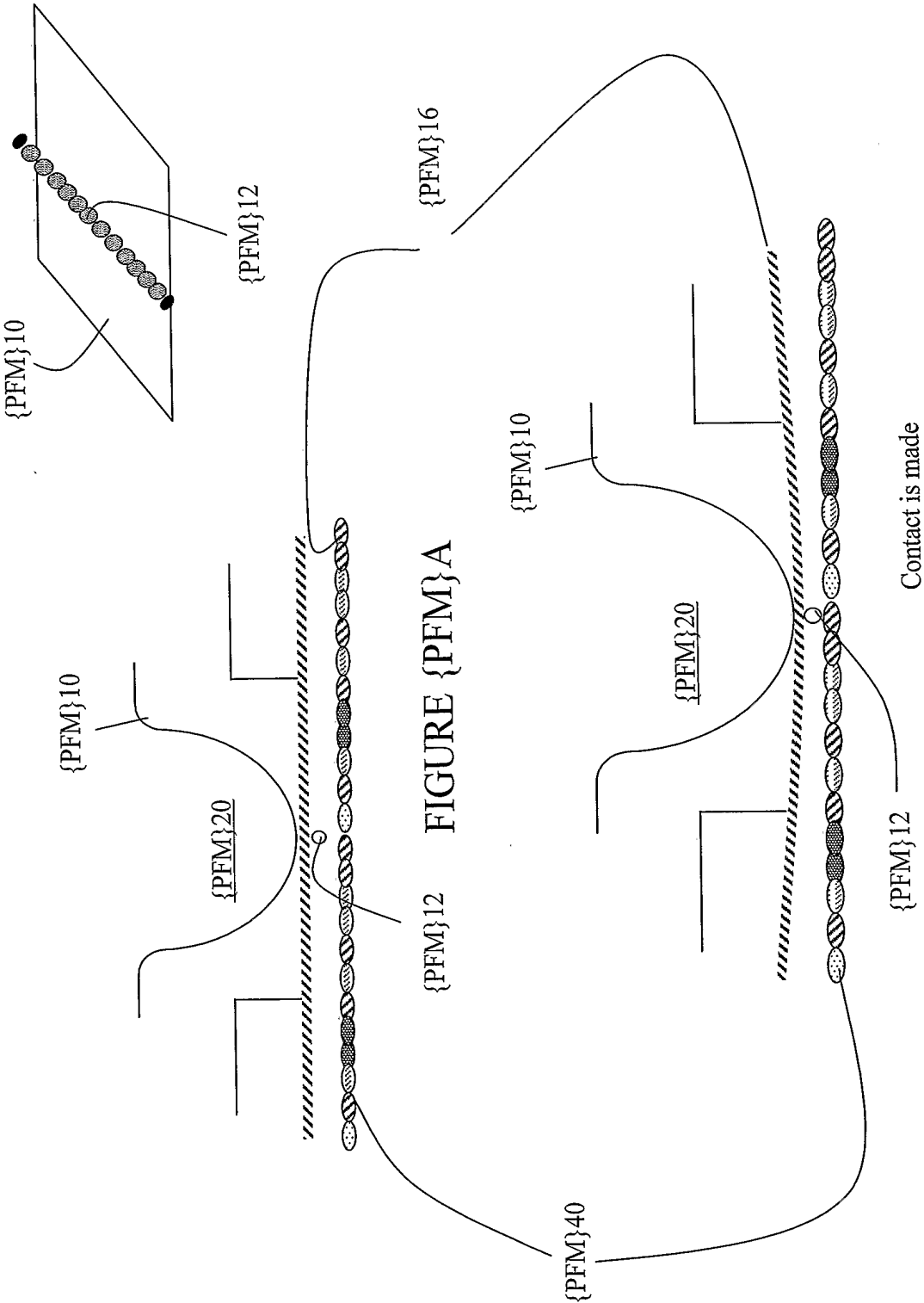


FIGURE 84



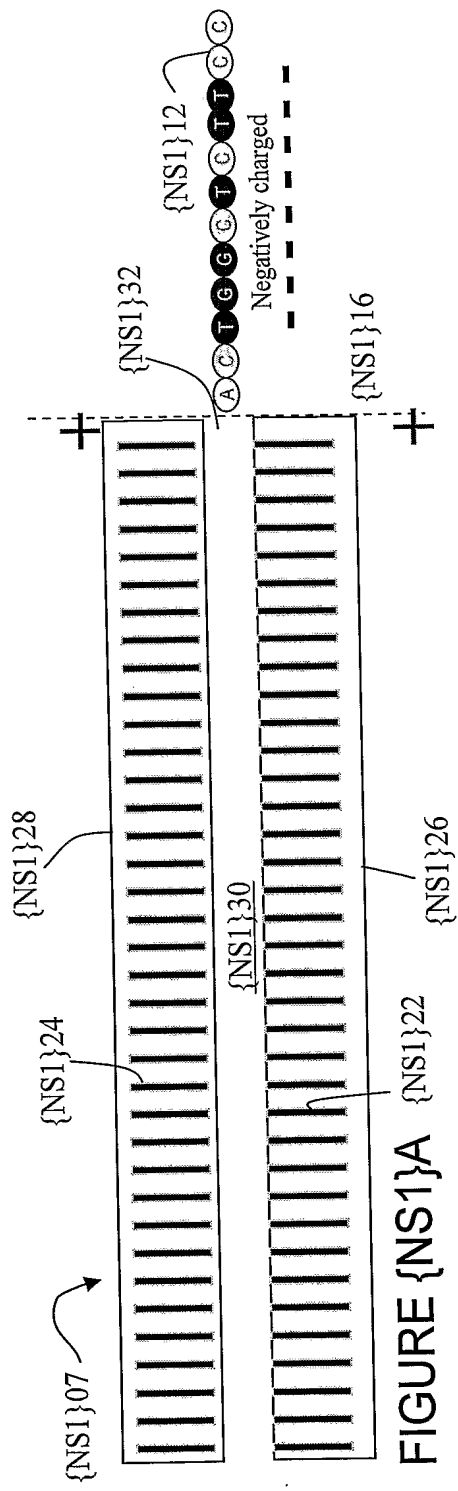


FIGURE {NS1}A

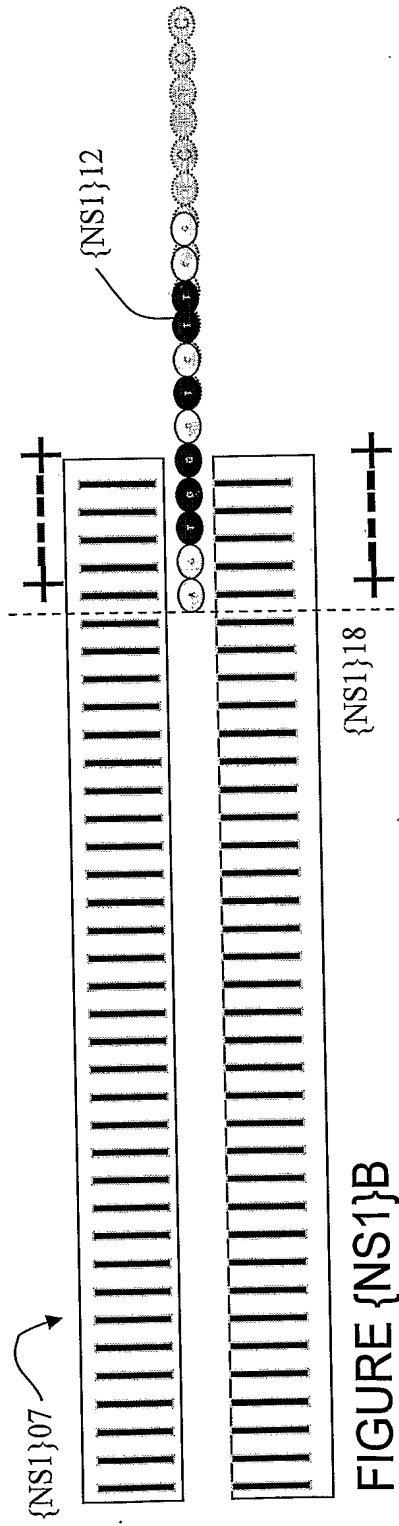


FIGURE {NS1}B

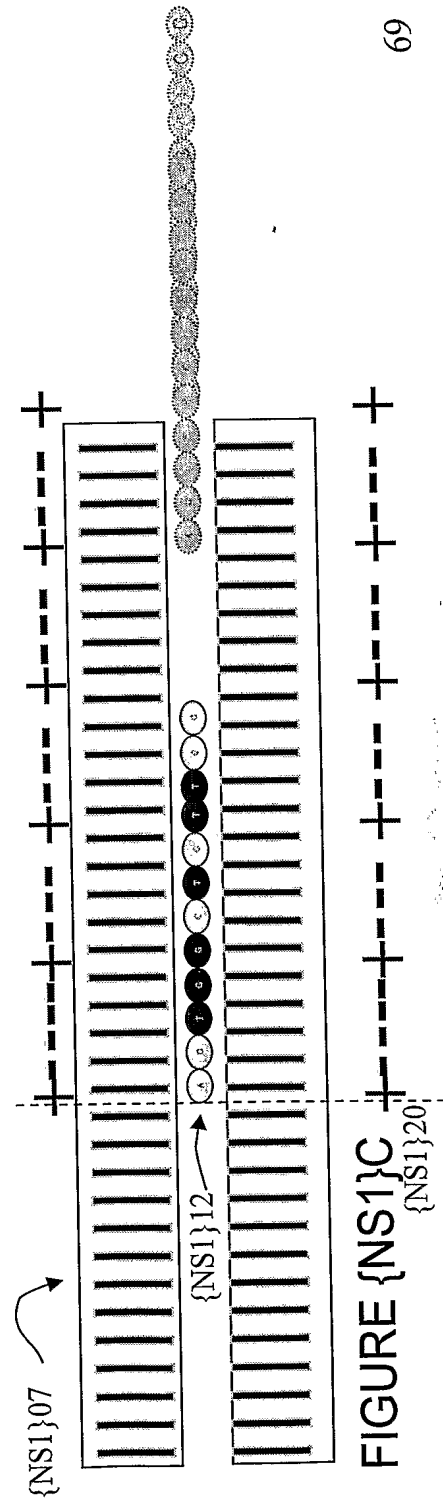


FIGURE {NS1}C

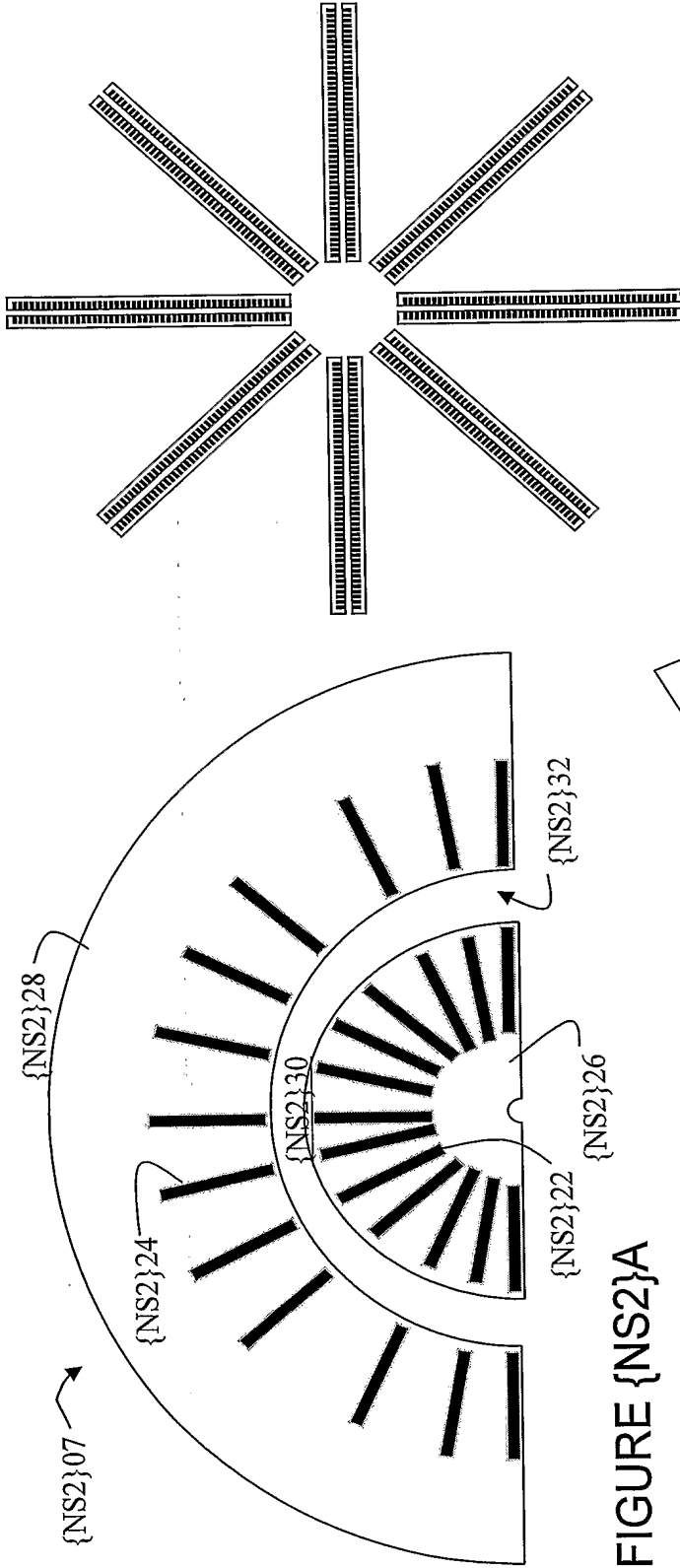


FIGURE {NS2}A

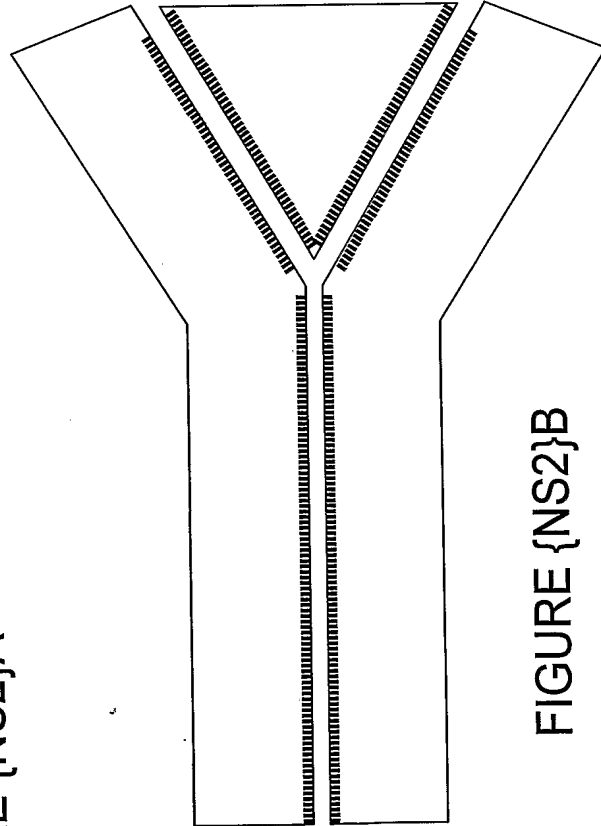


FIGURE {NS2}B

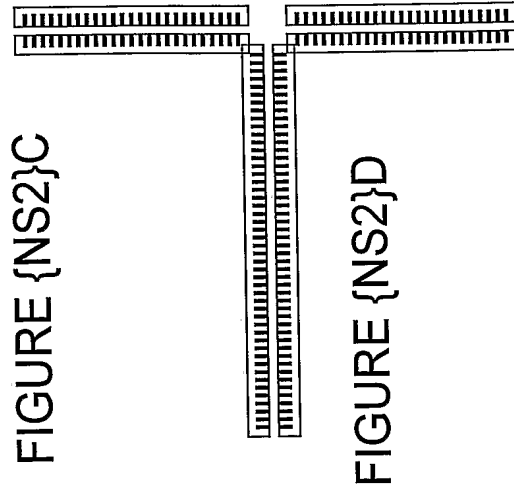
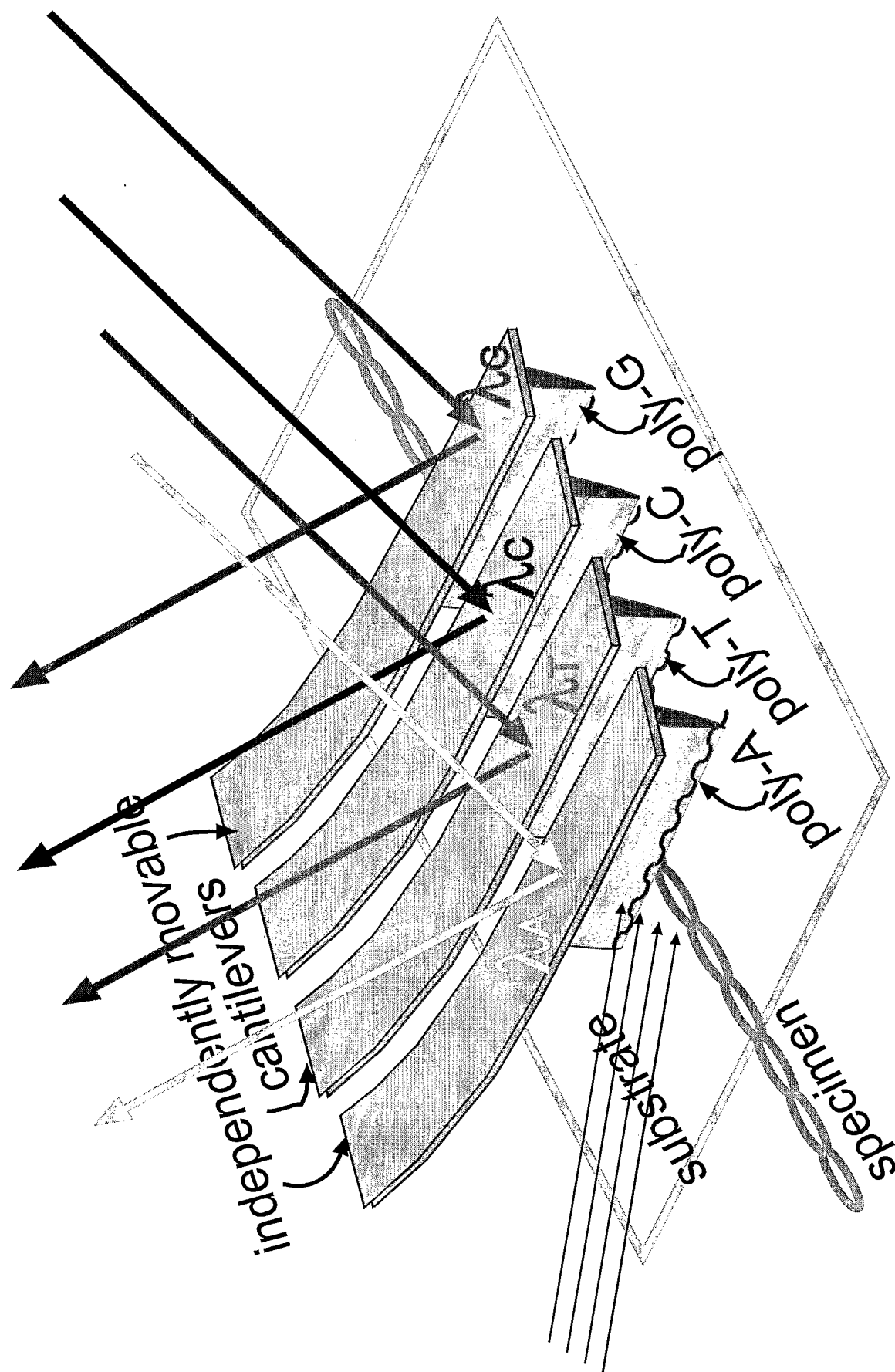


FIGURE {NS2}C

FIGURE {NS2}D



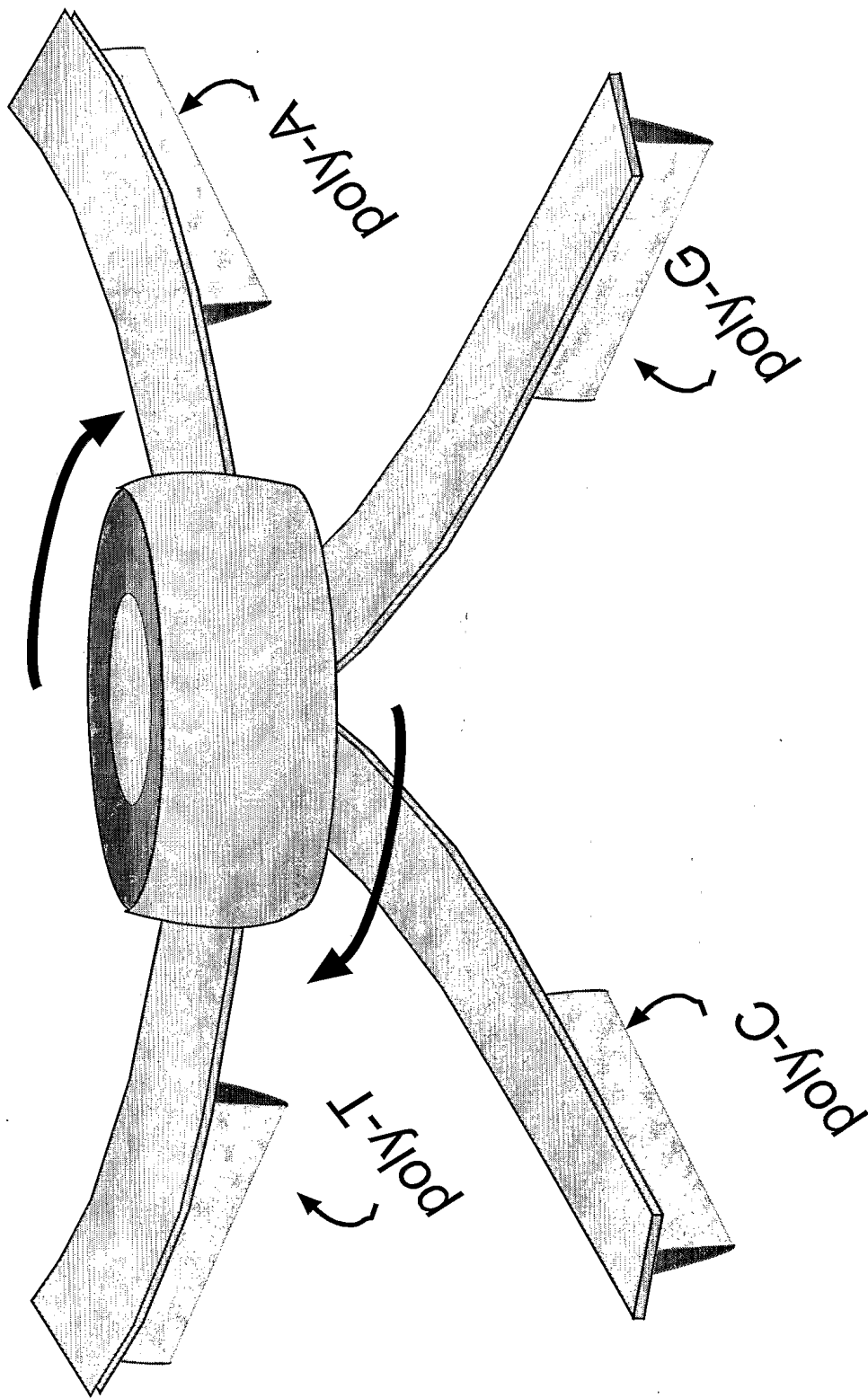


Figure {AFM2}

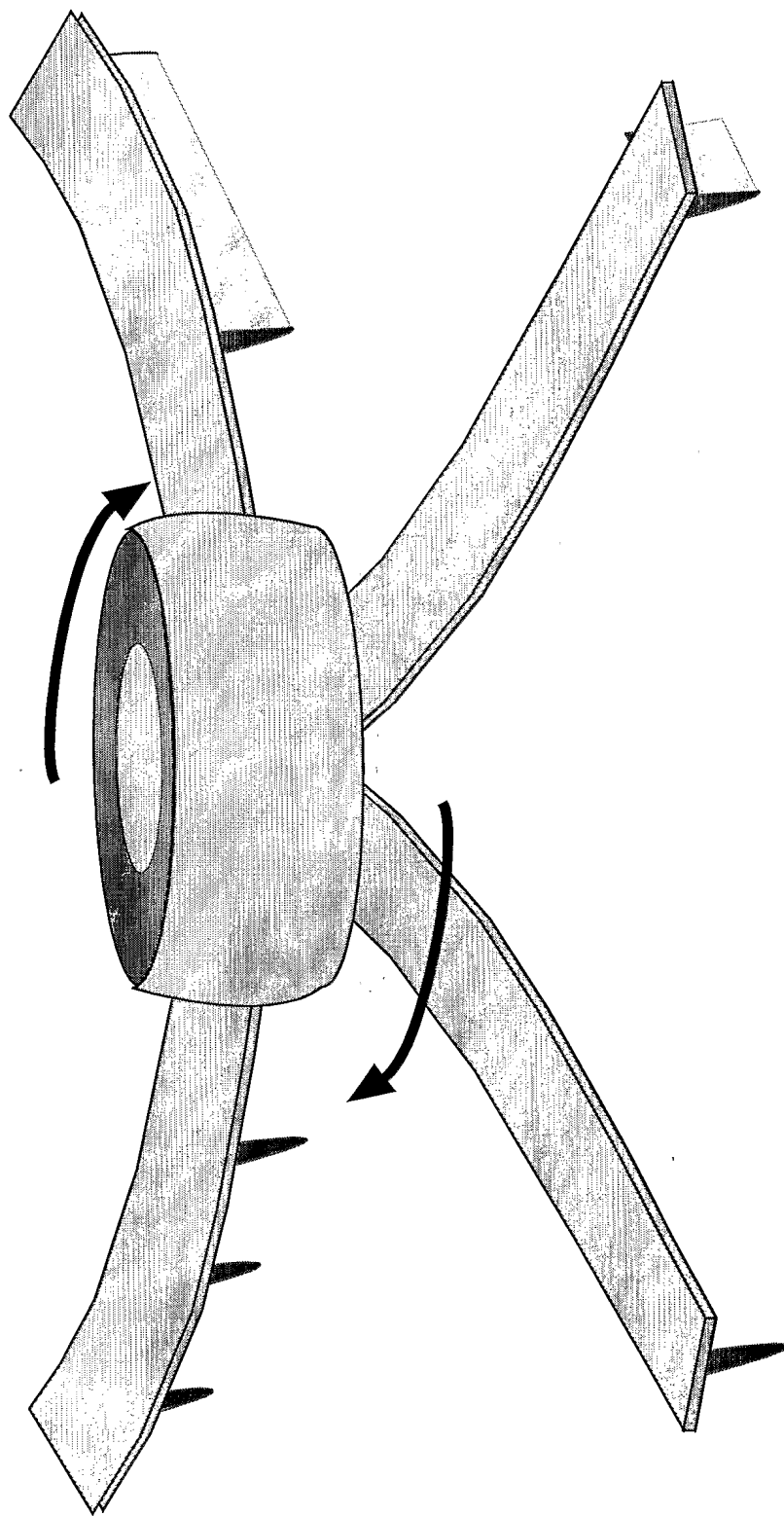


Figure {AFM3}

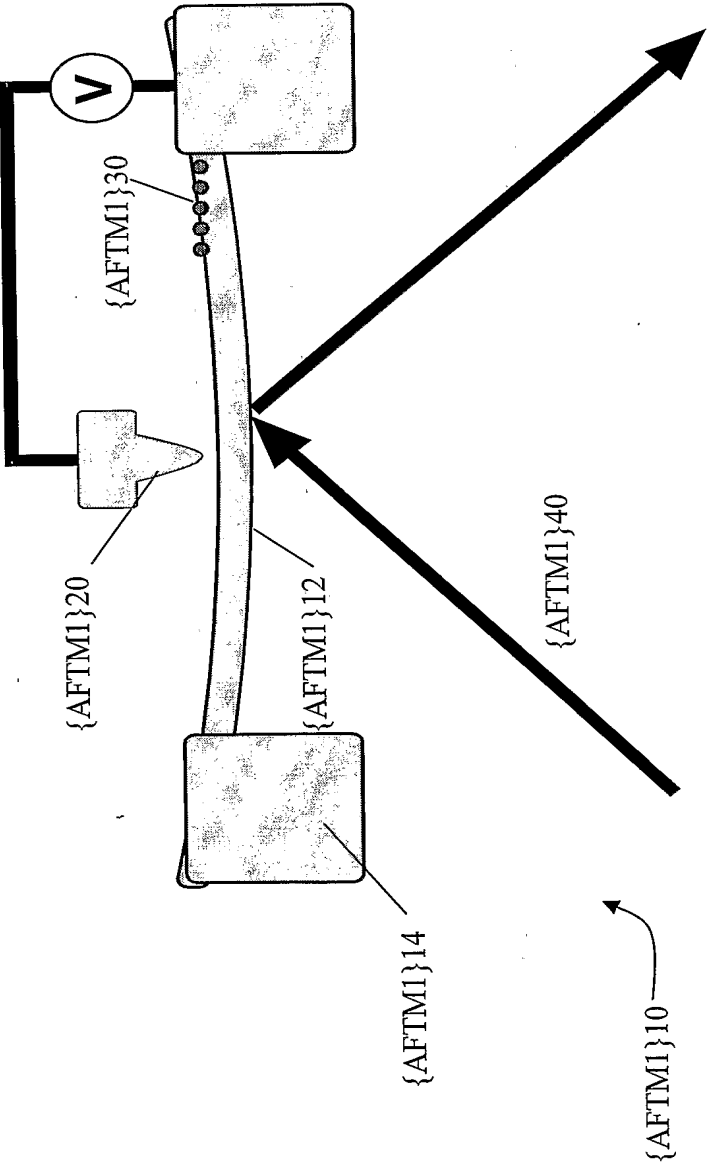


Figure {AFTM1}

Membrane AFM capacitively read and STM combination
Images first them sequences with daisy wheel probes
and alignemnt marks

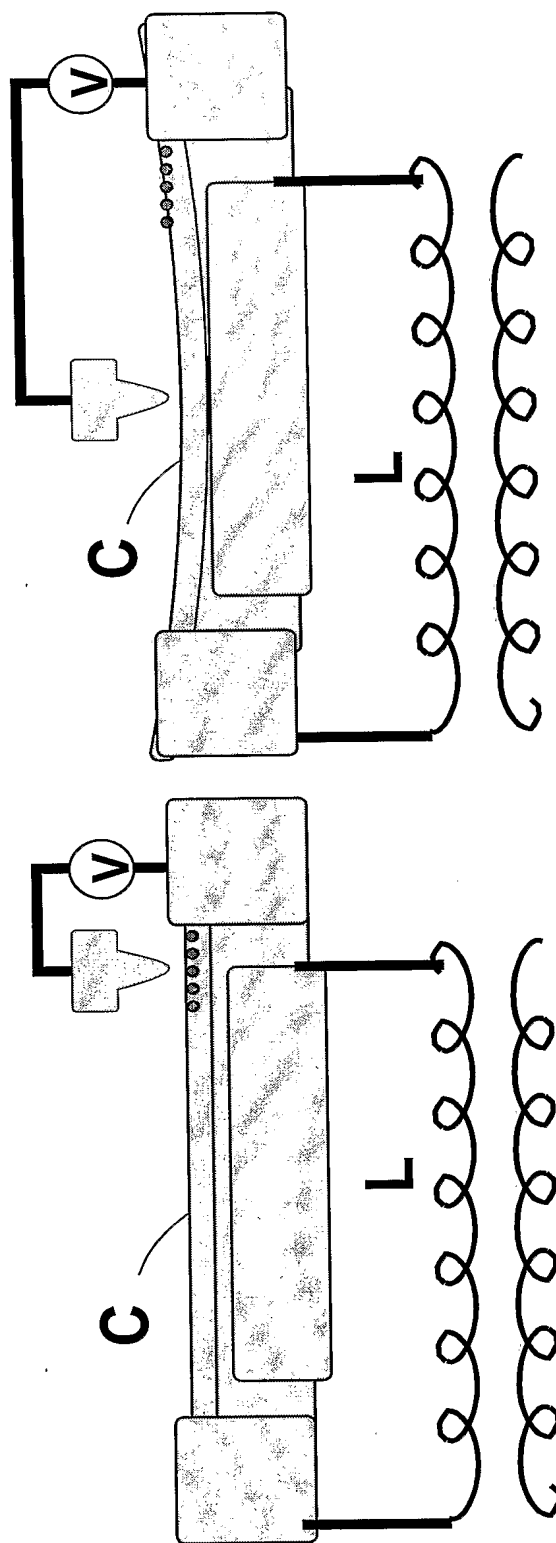


Figure {AFTM2}A

Figure {AFTM2}B

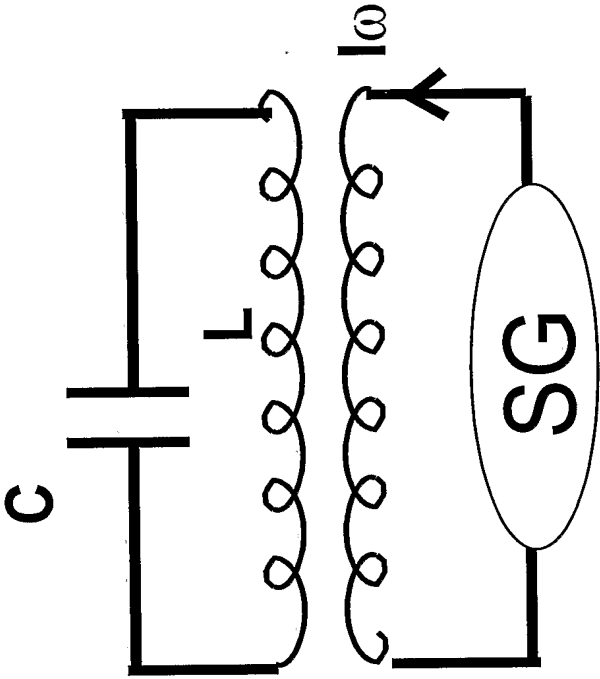


Figure {AFTM2}C

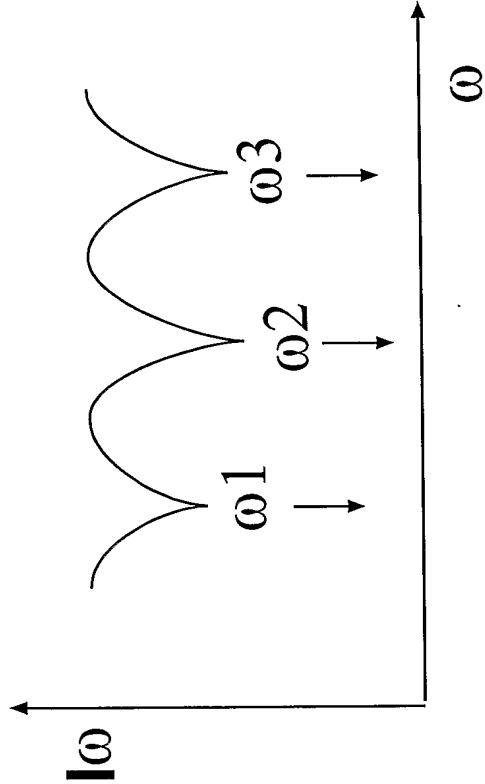


Figure {AFTM2}D

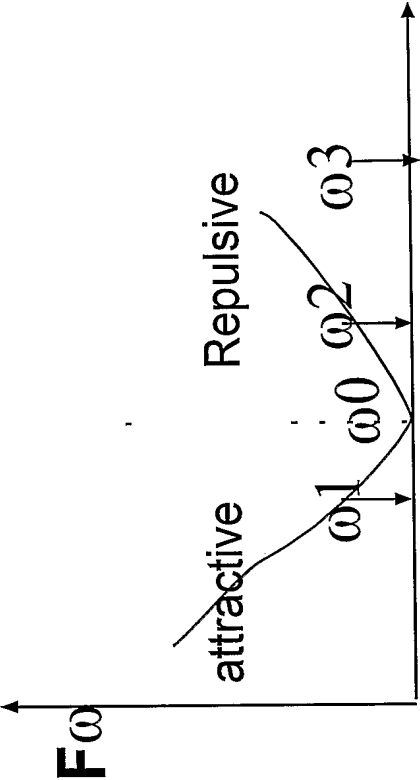


Figure {AFTM2}E

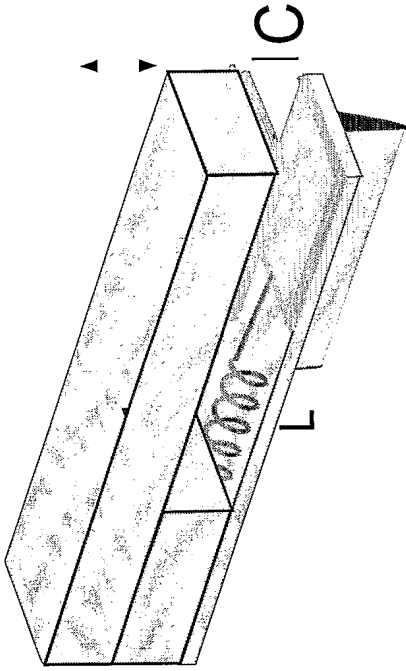


Figure {AFTM3}A

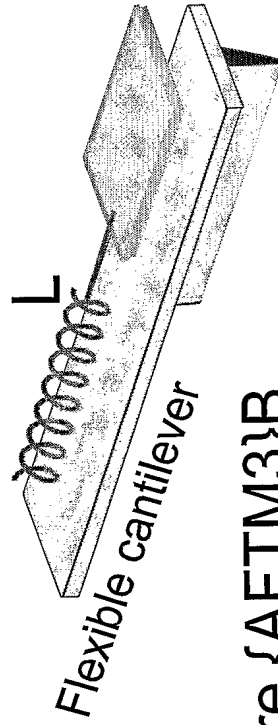
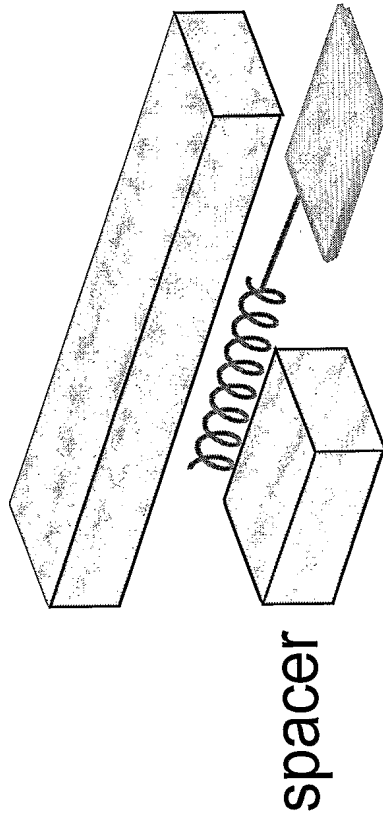


Figure {AFTM3}B

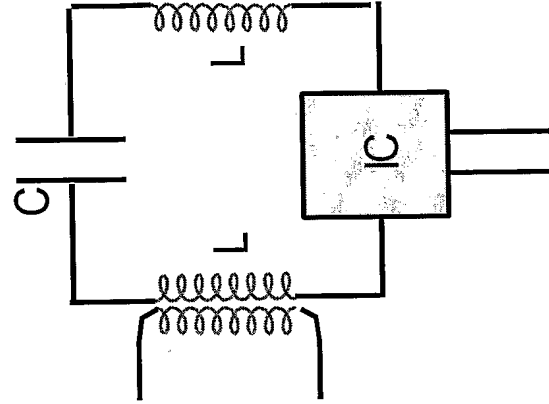


Figure {AFTM3}C

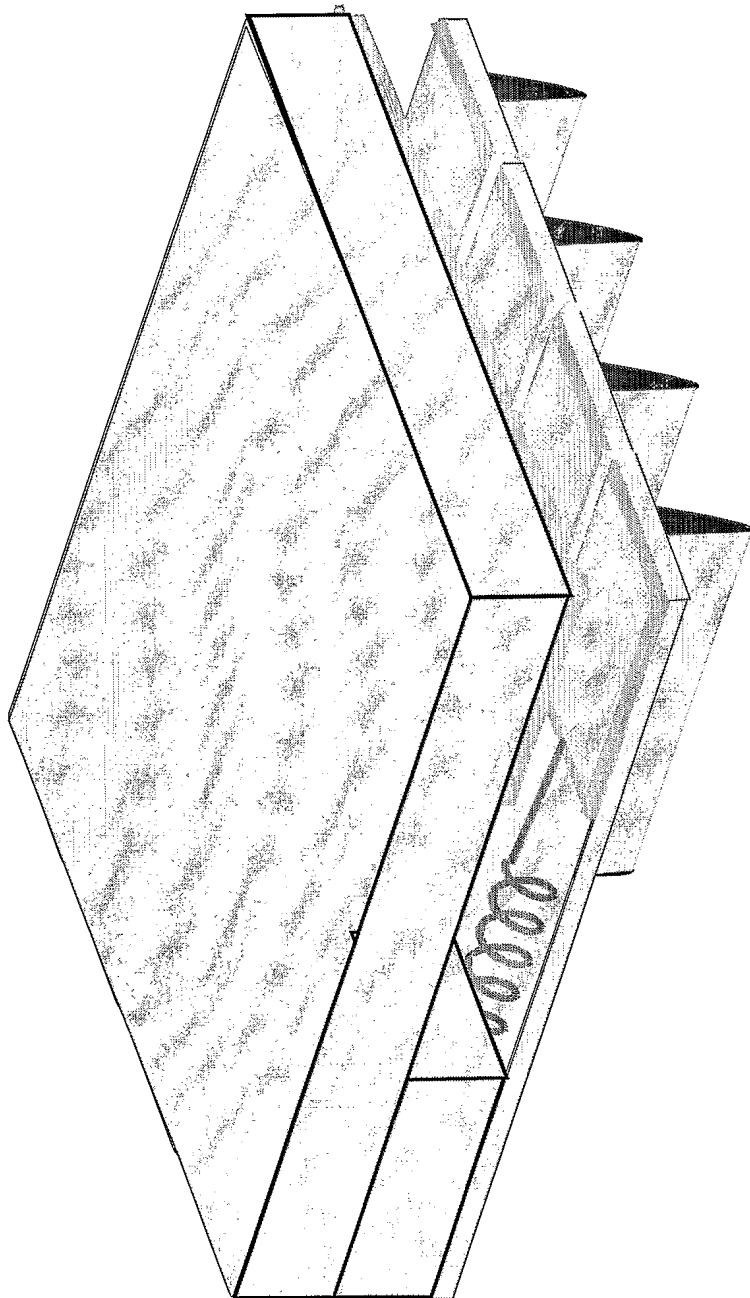


Figure {AFTM4}

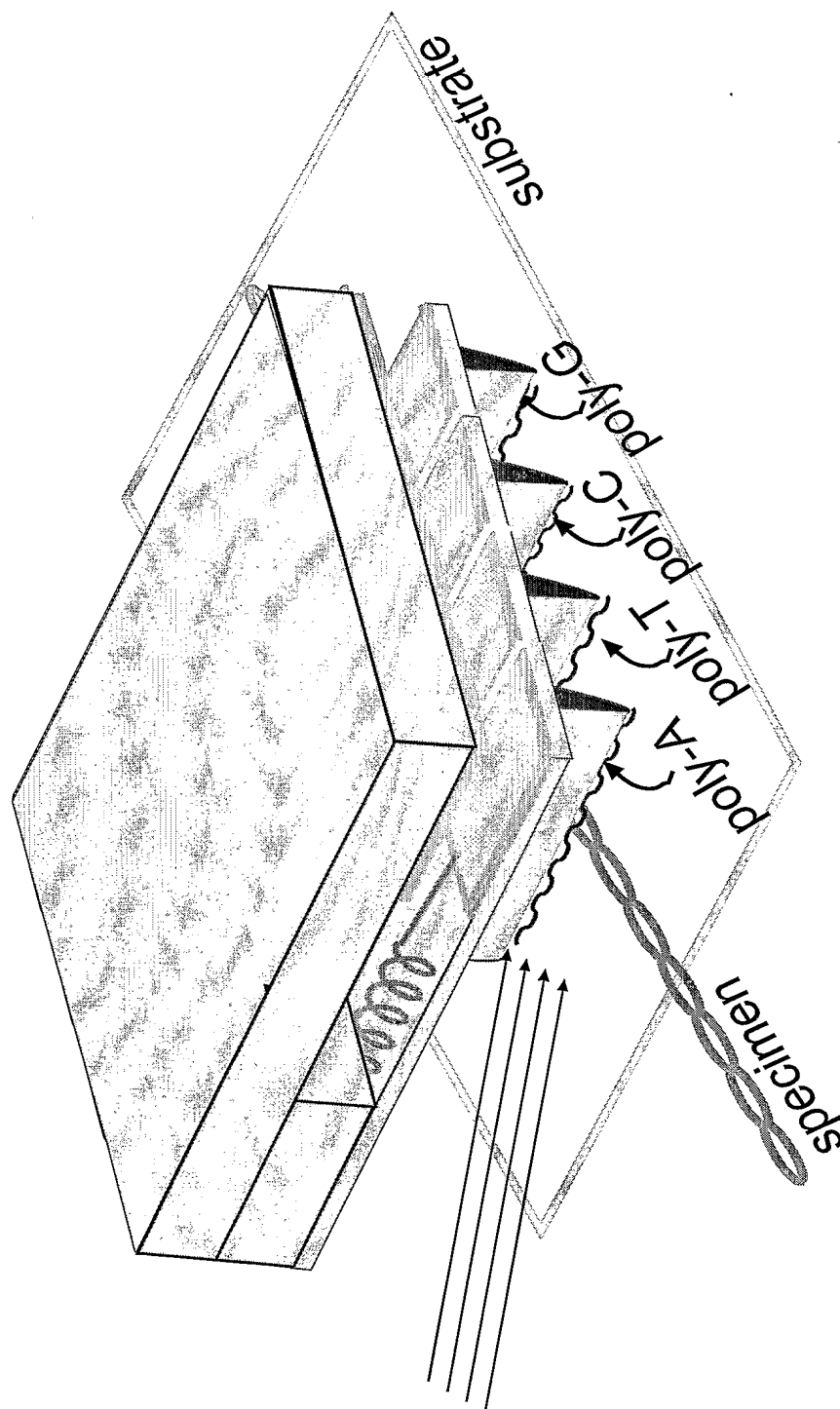


Figure {AFTM5}

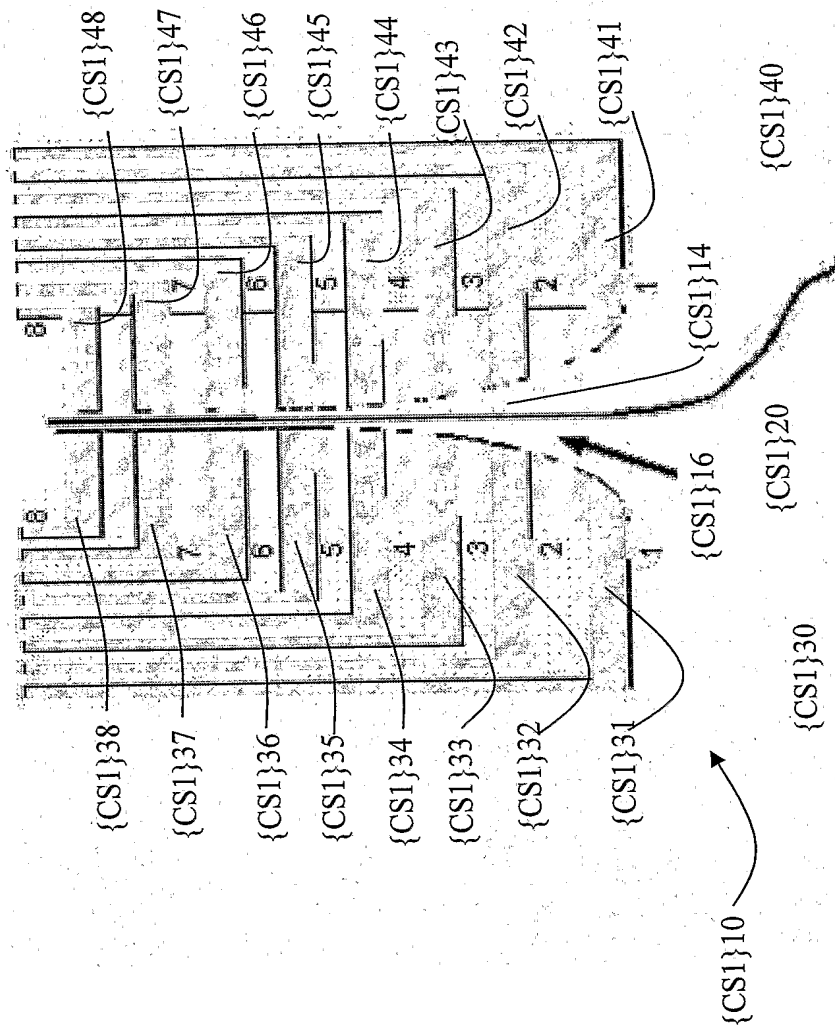


Figure {CS1}

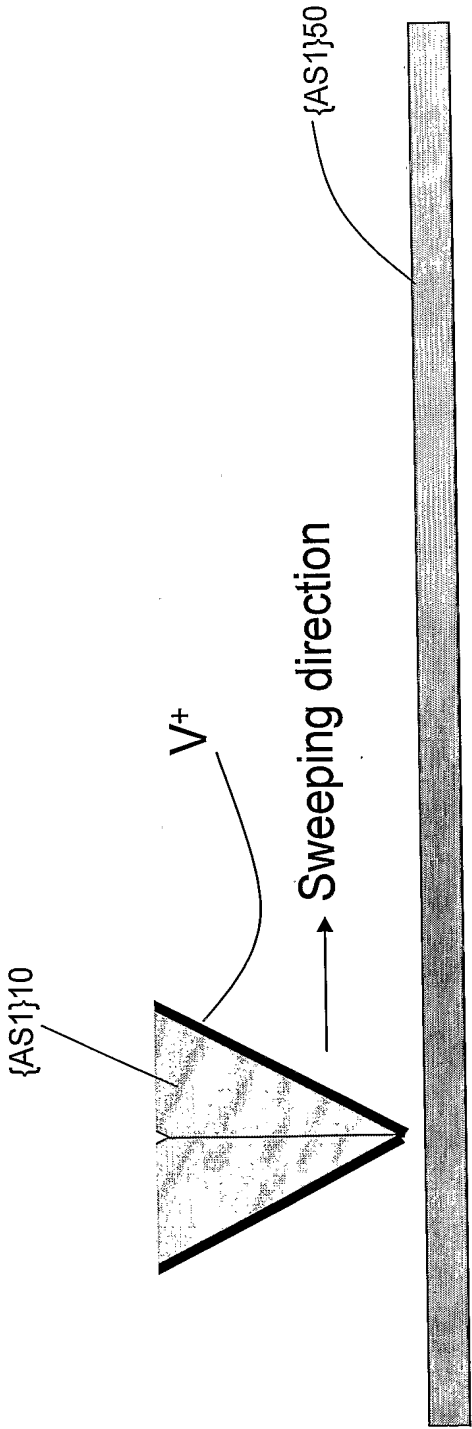


Figure $\{AS1\}$

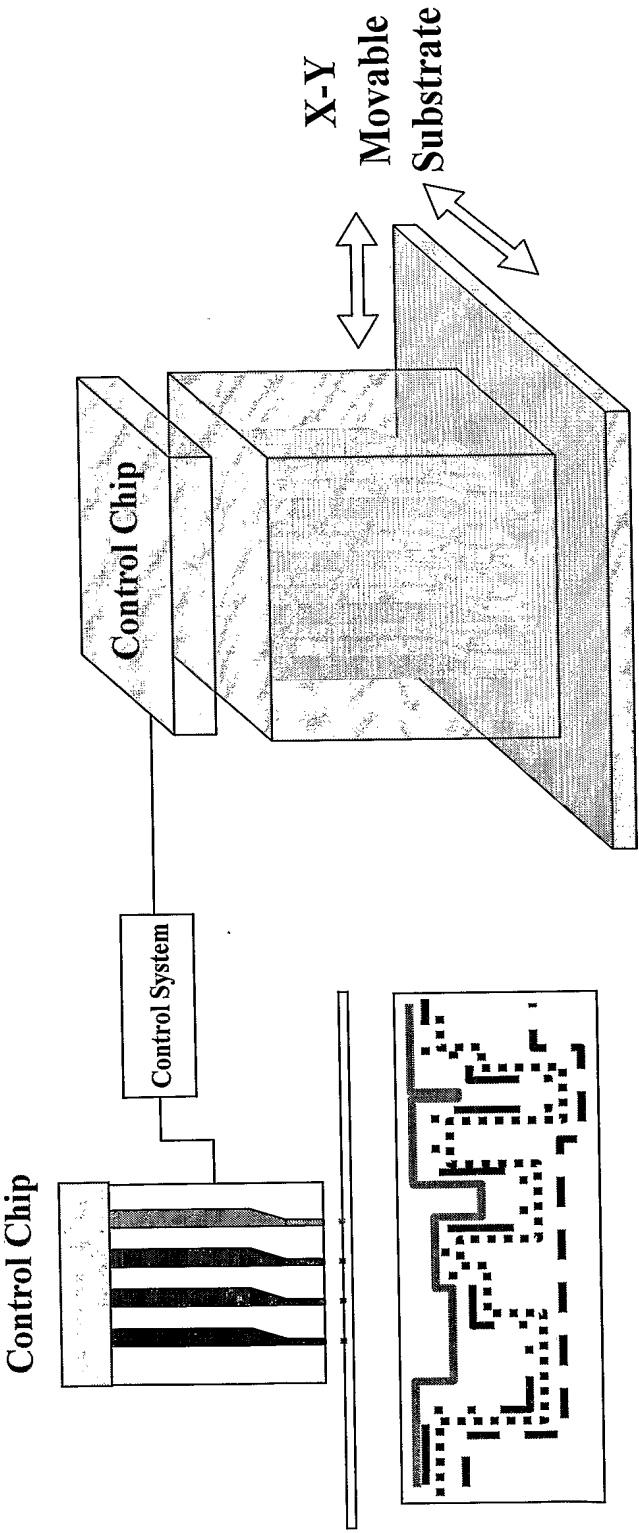


Figure {LITH1}

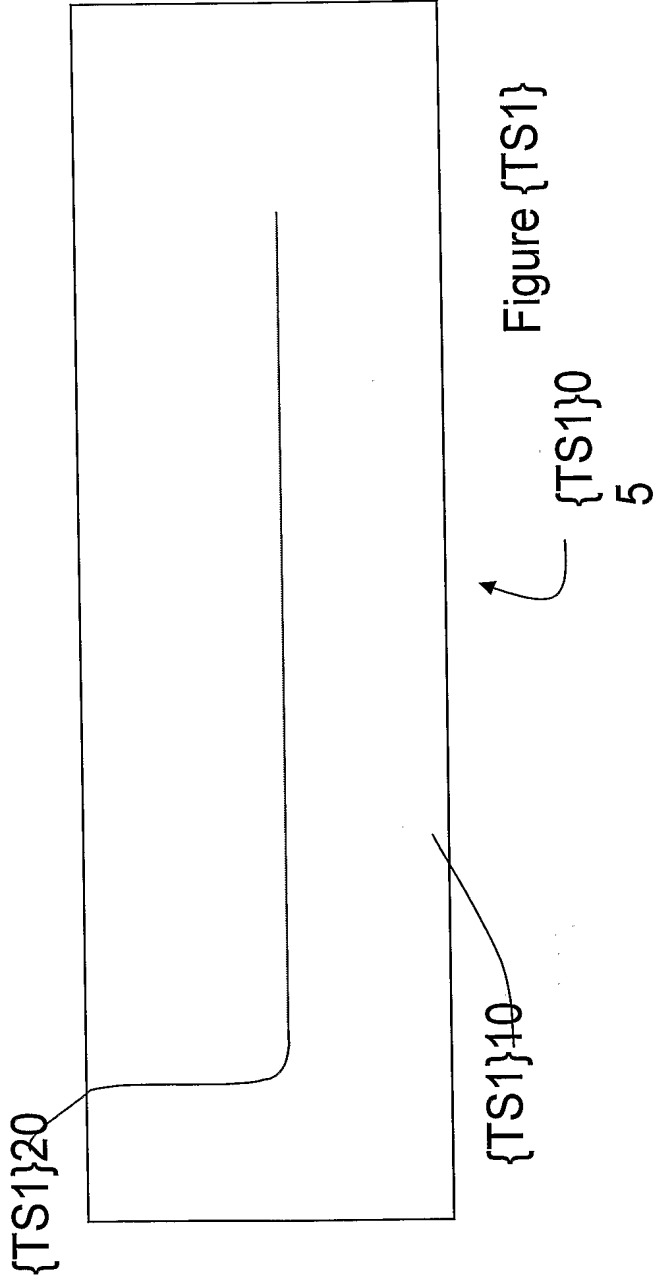


Figure {TS1}

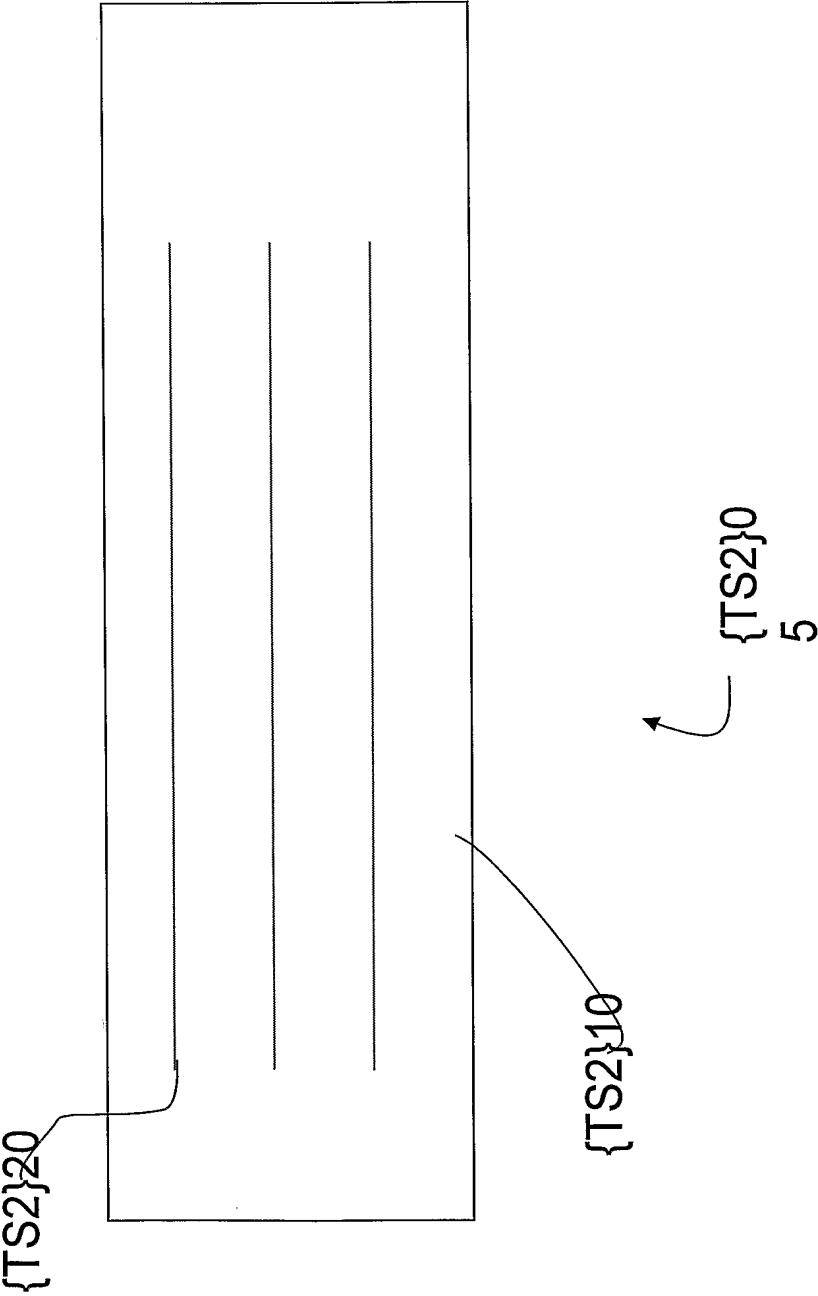
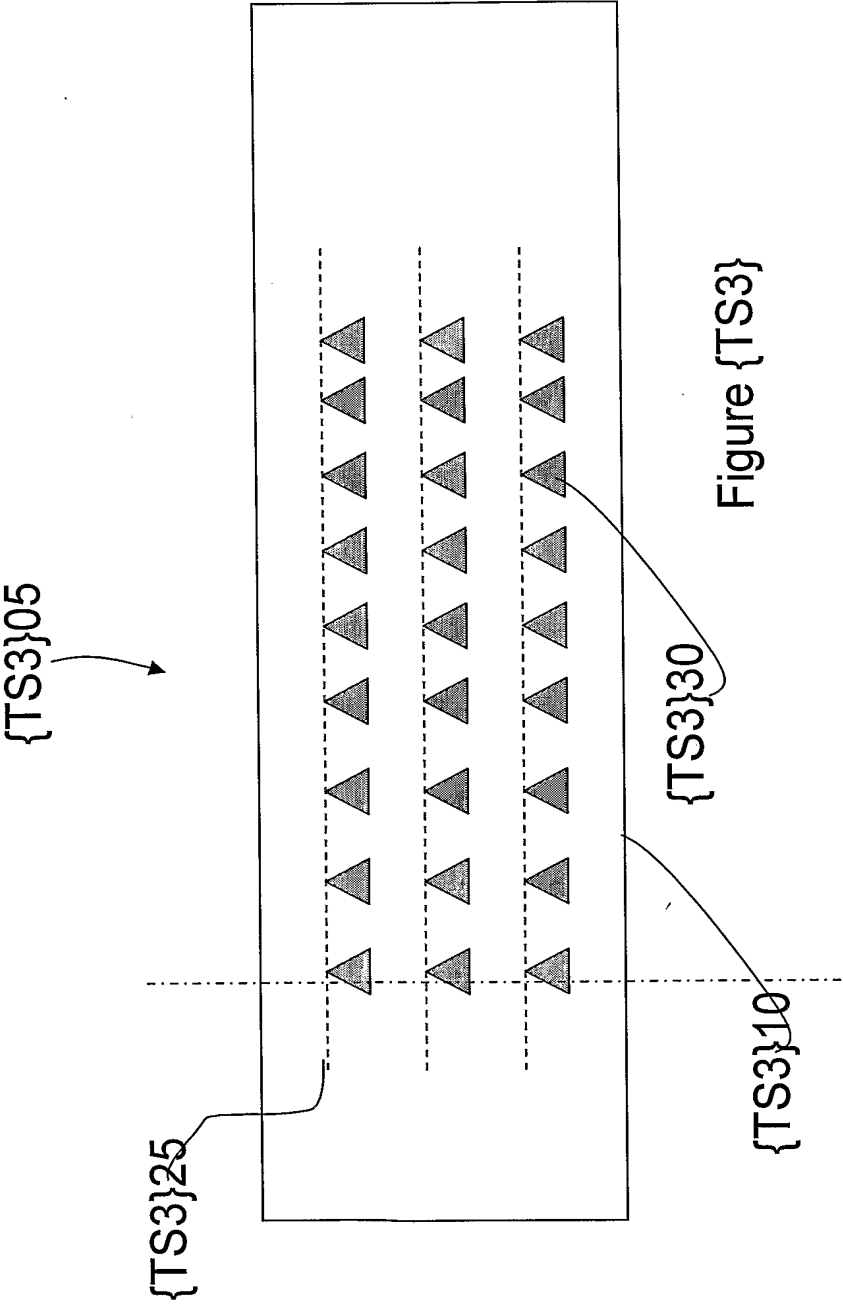
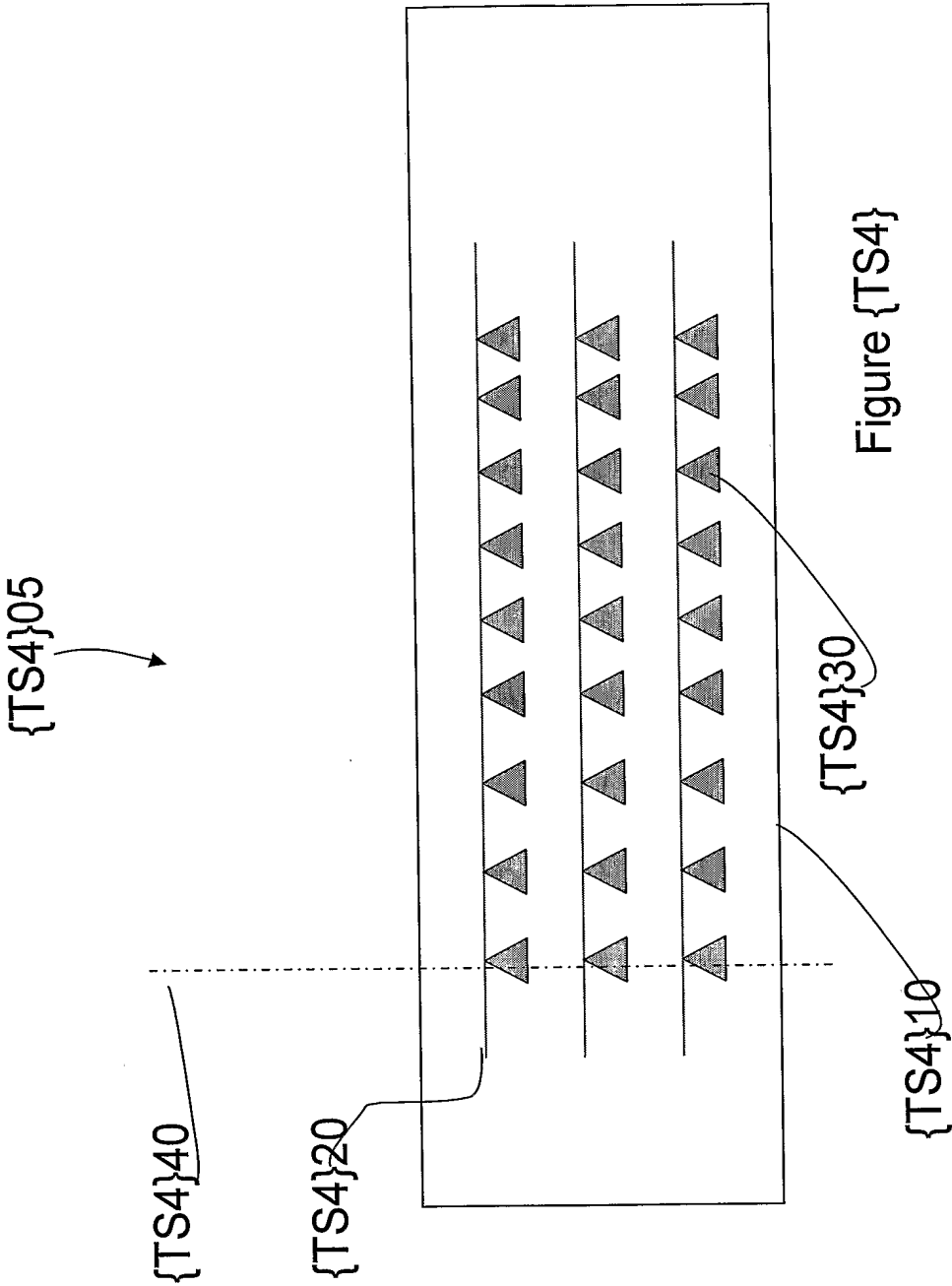


Figure {TS2}





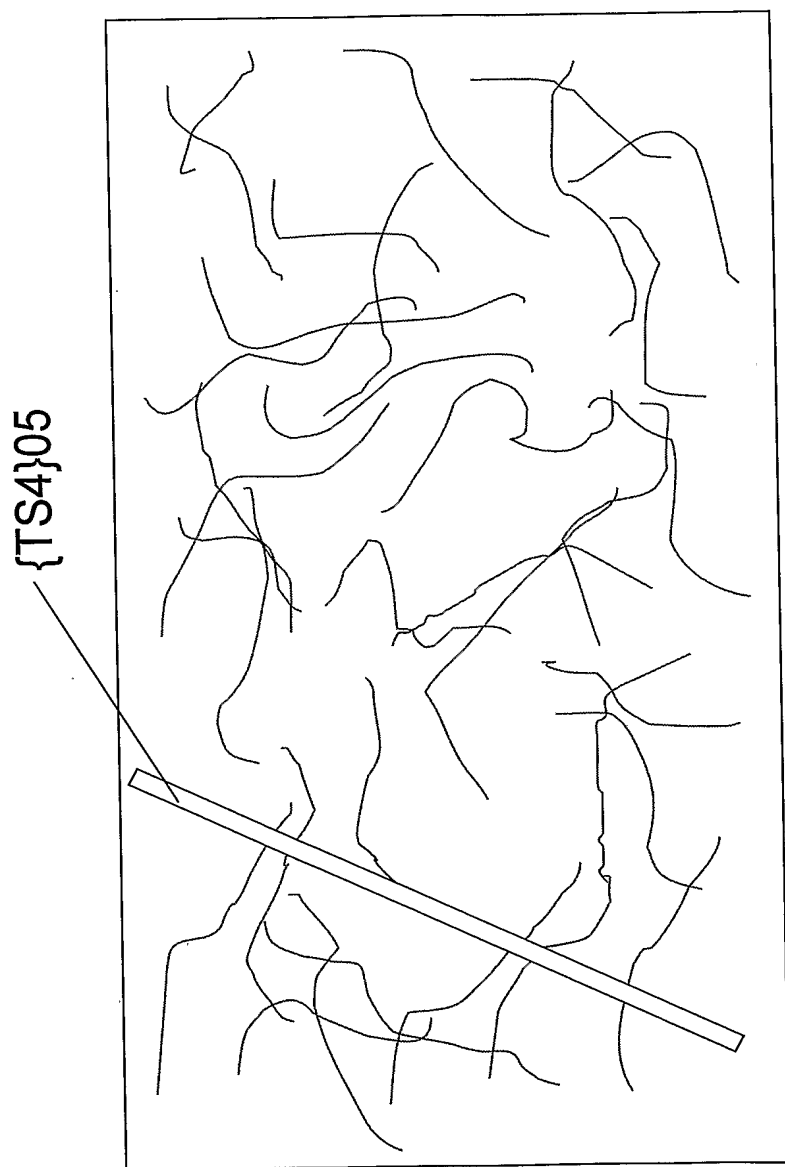


Figure {TS5}A

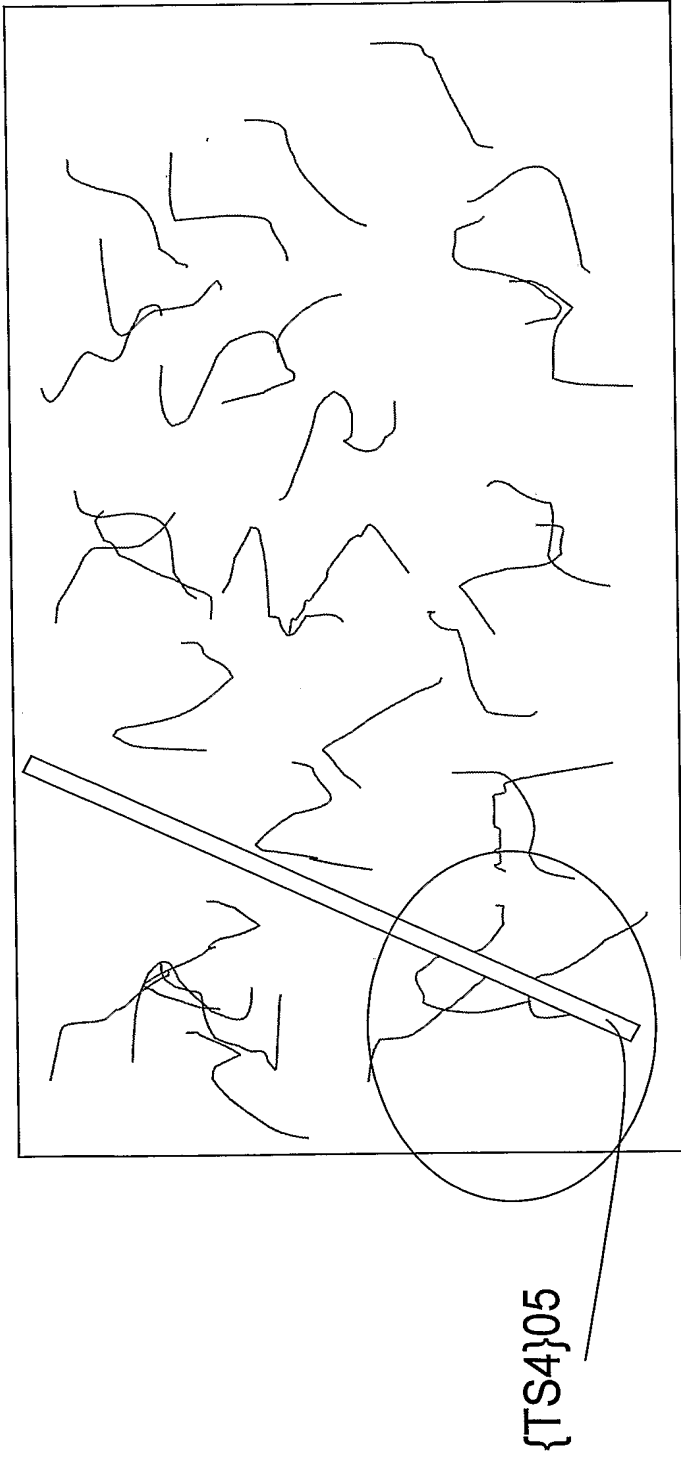
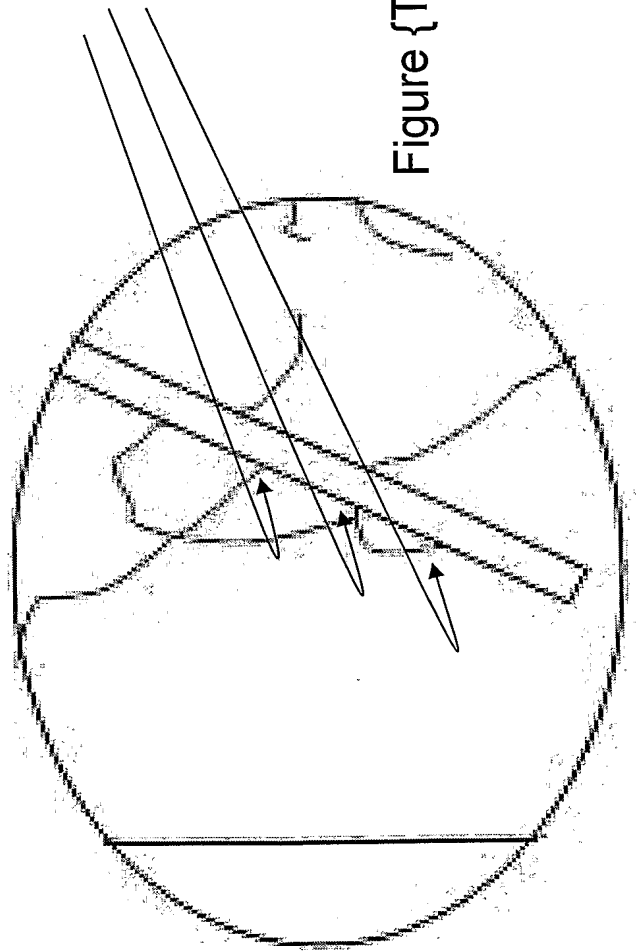


Figure {TS5}B



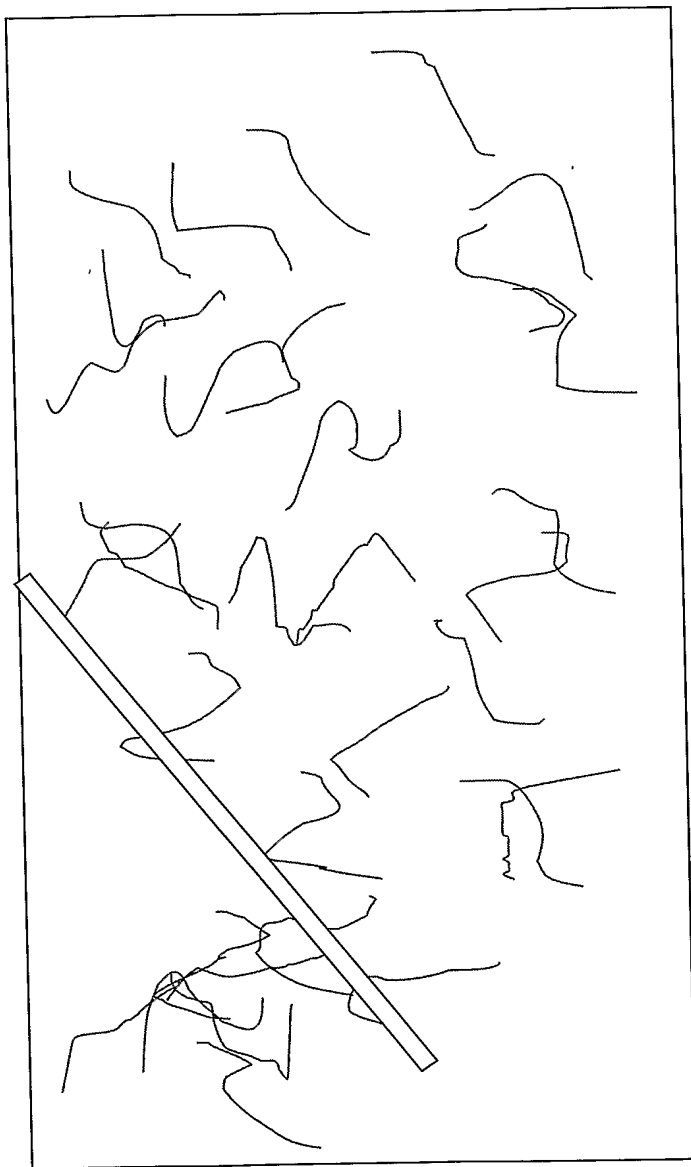


Figure {TS5}D

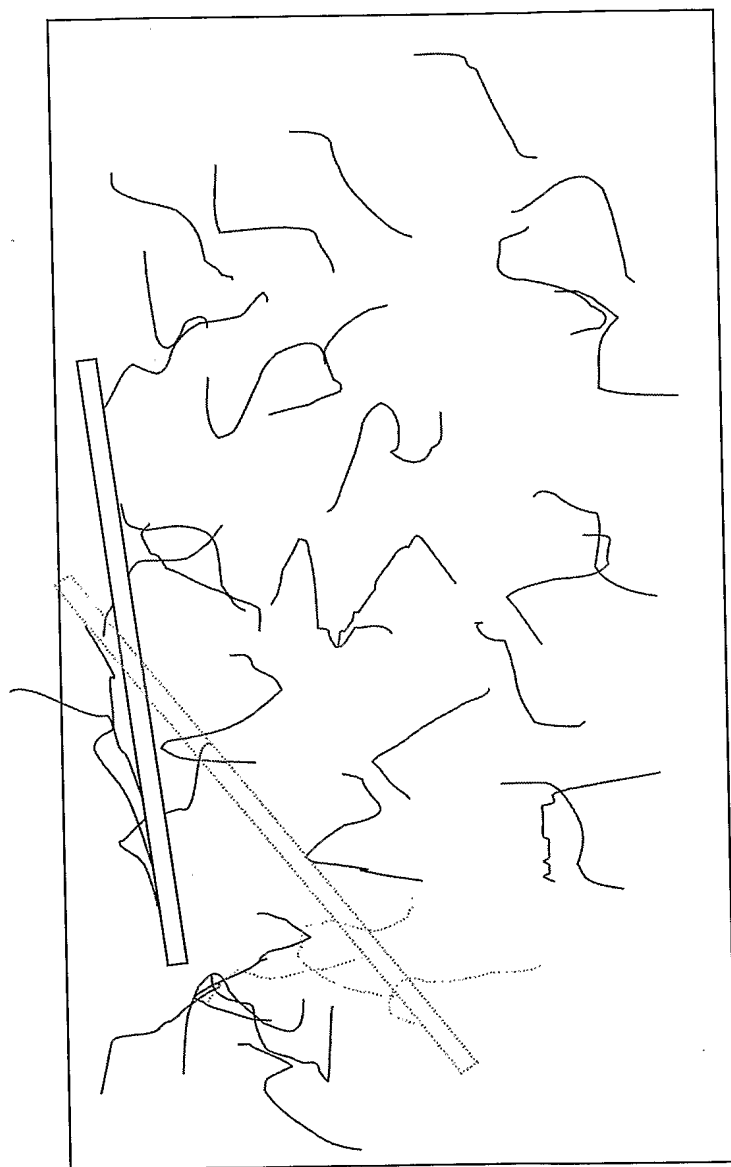
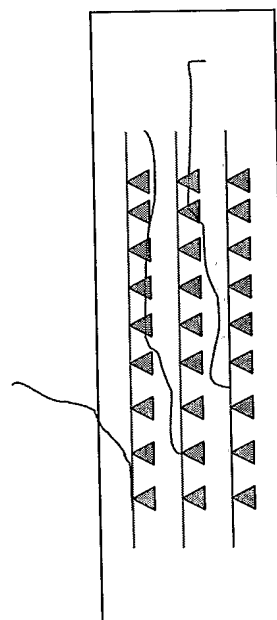


Figure {TS5}E



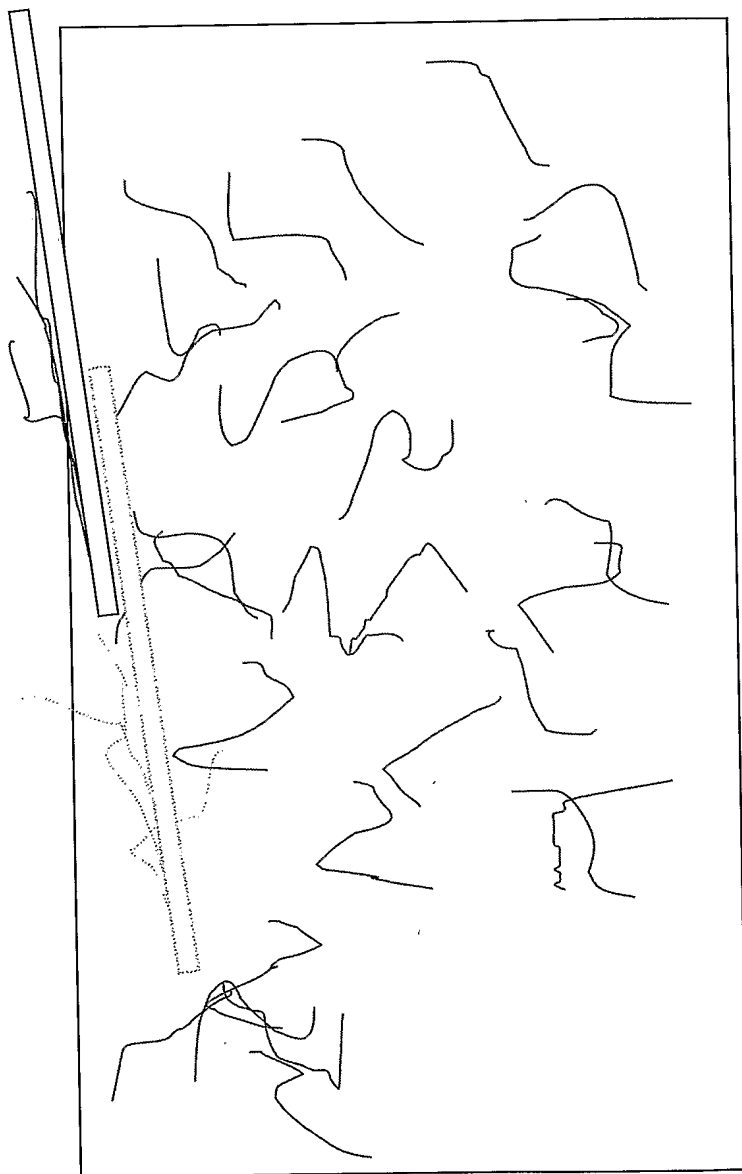
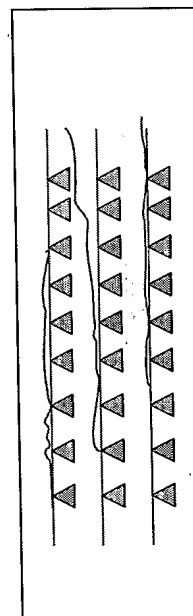


Figure {TS5}F



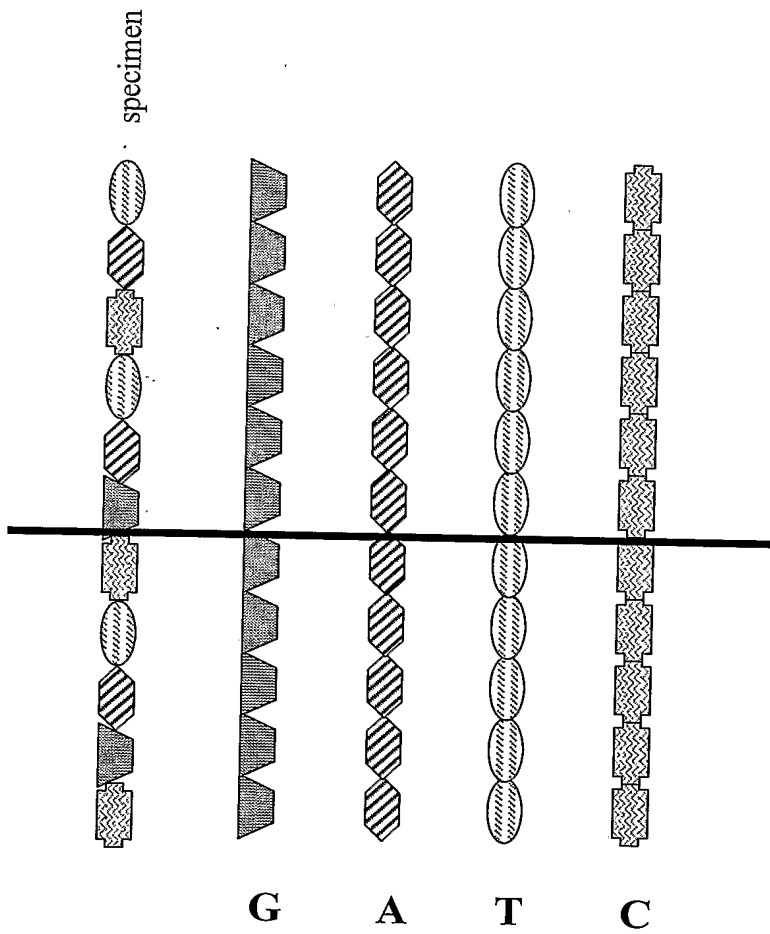


Figure {DD1}